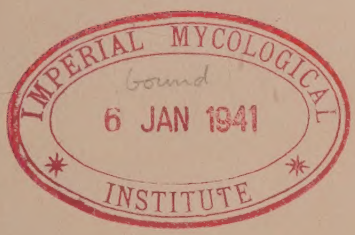
HERB.



COMMONWEALTH MYCOLOGICAL INSTITUTE

Order **USTILAGINALES**[1]

By George Perkins Clinton

Parasitic fungi infesting various parts of herbaceous flowering plants. Infection through the very young tissues of any part of the host or more frequently limited to special portions, often only through the germinating seed. Mycelium local or widespread, consisting of hyaline, somewhat septate, branched filaments practically limited to the interior of the host; at maturity often disappearing partially or wholly through gelatinization; fertile mycelium compacting into masses and giving rise, in various ways, to chlamydospores formed from their internal contents; rarely developing a conidial stage on the exterior of the host. Sori evident, usually forming dusty or agglutinated spore-masses that break out in definite places on the host; more rarely permanently embedded in the tissues. Spores (chlamydospores) light- to dark-colored, 4–35 μ in diameter, single, in pairs, or in spore-balls, the latter often composed in part of sterile cells. Germination by means of a promycelium, usually producing terminal or lateral sporidia which may be capable of a saprophytic existence in nature and which often reproduce themselves abundantly through a yeast-like process of budding.

Promycelium usually with lateral sporidia at septa.	Fam. 1. Ustilaginaceae.
Promycelium with clustered terminal sporidia.	Fam. 2. Tilletiaceae.

[1] This paper is based on the writer's monograph of North American Ustilagineae (Proc. Bost. Soc. Nat. Hist. 31: 329–529) published in October, 1904. In the present paper there are omitted the general notes, notes under genera and species, most of the older European synonyms, the list of species showing general distribution, and the bibliography. There are added to the paper such further species, hosts, and distributions as have since come to hand. The following are the additional species and varieties described here: *Entyloma Holwayi* Sydow, *Sphacelotheca diplospora glabra* Clinton & Ricker, var. nov., *Sphacelotheca diplospora verruculosa* Clinton, var. nov., *Tilletia Eragrostidis* Clinton & Ricker, *Tilletia Muhlenbergiae* Clinton, sp. nov., *Tilletia Redfieldiae* Clinton, sp. nov., *Tolyposporium globuligerum* (Berk. & Br.) Ricker, *Urocystis Lithophragmae* Garrett, sp. nov., *Ustilago Kellermanii* Clinton, sp. nov., *Ustilago punctata* Clinton, sp. nov., *Ustilago Rickerii* Clinton, sp. nov., *Ustilago Sieglingiae* Ricker. *Ustilago Panici-leucophaei* Bref. has been placed under the genus *Sphacelotheca*. Under each species have also been added references to the type locality (including host) and to illustrations of the species. The names of the hosts have been made to conform in general with the nomenclature to be used in the Flora. Under each species, however, the writer has indicated in parentheses the former name when there has been a change. Finally there have been added under the genera artificial keys to aid in the identification of the species.

Family 1. USTILAGINACEAE

By George Perkins Clinton

Sori usually forming exposed dusty or agglutinated spore-masses. Germination by means of a septate promycelium which gives rise to terminal and lateral sporidia (capable of yeast-like multiplication in nutrient solutions) or else to infection-threads.

Spores single.	
Sori dusty at maturity.	
Without definite false membrane.	1. Ustilago.
With false membrane of definite fungous cells.	2. Sphacelotheca.
Sori agglutinated at maturity.	
Firmly agglutinated into conspicuous tubercular nodules.	3. Melanopsichium.
Developed around a central columella (rarely dusty).	4. Cintractia.
Spores chiefly in pairs.	
Sori agglutinated (on leaves).	5. Schizonella.
Sori dusty (inside peduncles).	6. Mykosyrinx.
Spores in balls.	
Sori dusty or granular.	
Spore-balls often evanescent; spores olive-brown or black-brown.	7. Sorosporium.
Spore-balls rather permanent; spores yellowish or reddish, with markings only on free surface.	8. Thecaphora.
Spore-balls quite permanent; spores adhering by folds or thickenings of outer coat.	10. Tolyposporium.
Sori agglutinated.	
Spore-balls (variable) composed of thick-walled spores.	9. Tolyposporella.
Spore-balls with peripheral spores and central sterile cells.	11. Testicularia.

1. USTILAGO (Pers.) Roussel,[1] Fl. Calvados ed. 2. 47. 1806.

Necrosis Paulet, Traité Champ. 1: 548; hyponym. 1793.
Uredo § *Ustilago* Pers. Syn. Fung. 224. 1801.
Ustilagidium Herzb. in Zopf, Beitr. Phys. Morph. Org. 5: 7. 1895.

Sori on various parts of the hosts, at maturity forming dusty, usually dark-colored spore-masses; spores single, produced irregularly in the fertile mycelial threads which early entirely disappear through gelatinization, small to medium in size; germination by means of a septate promycelium producing only infection-threads or with sporidia formed terminally and laterally near the septa; sporidia in water usually germinating into infection-threads but in nutrient solutions multiplying indefinitely, yeast fashion.

Type, *Uredo segetum* Pers.

A. Spores reddish-, olive-, or black-brown.

1. Spores perfectly smooth (see also nos. 3, 19, 25, 33).	
Spores small, 4–10 μ in length.	
Sori around the internodes.	
Sori with false membrane of fungous threads.	1. *U. minima.*
Sori without evident false membrane.	2. *U. hypodytes.*
Sori envolving entire inflorescence.	20. *U. Panici-proliferi.*
Sori in individual spikelets.	
Spores lighter-colored on one side.	
Sori small, about 1 mm. in length.	5. *U. mexicana.*
Sori 6–10 mm. in length.	
Hosts: *Avena;* spore-mass brown-black.	7. *U. levis.*
Hosts: *Hordeum;* spore-mass purple-black.	6. *U. Hordei.*

[1] J. Bauhin, Hist. Pl. 2: 418, in 1651, is really the founder of *Ustilago*. Fries or Persoon is ordinarily cited as the authority for the genus. Fries used *Ustilago* as a genus in his Syst. Myc. 3: 517, in 1832, with *U. grandis* as the first species. Persoon used *Ustilago* as a subgenus under *Uredo* with *Uredo segetum* as the first species, having five varieties of which α *U. Hordei* is first, and this may be taken as the actual type now that *U. segetum* has been broken up into several species. Roussel merely adopted *Ustilago* from Persoon, but raised it to full generic rank, giving three of Persoon's four species, of which *U. segetum* is one. Paulet's name, *Necrosis*, cannot be regarded as a true generic name, but was used more as a descriptive term.

Spores uniformly colored.
Sori completely destroying spikelets. 14. *U. affinis.*
Sori usually destroying inner and basal parts. 17. *U. Crameri.*
Sori in leaf-sheaths or blades; spores 8–11 μ. 4. *U. calcara.*
Spores medium, 10–14 μ in length; sori in ovaries. 18. *U. lycuroides.*
Spores large, 13–22 μ in length, the inner coat with projections. 58. *U. Heufleri.*
2. Spores often apparently smooth but at least granular under an immersion lens.
Sori in leaves; spores scarcely granular. 3. *U. longissima.*
Sori in inflorescence, sometimes confined to spikelets. 13. *U. residua.*
Sori in spikelets.
Sori rather completely destroying spikelets. 15. *U. Lorentziana.*
Sori destroying only basal and inner parts. 16. *U. bromivora.*
Sori in ovaries; spores apparently smooth. 19. *U. Rickerii.*
Sori in flowers protected by perianth. 23. *U. Tillandsiae.*
3. Spores echinulate or verruculose (occasionally minutely or obscurely).
Spores small, 4–9 μ in length.
Sori in leaves.
Sori in striae or areas of considerable extent. 21. *U. Ulei.*
Sori pustular. 31. *U. minor.*
Sori involving or aborting inflorescence.
Sori ovoid to subspherical; spores 4–6 μ. 12. *U. Muhlenbergiae.*
Sori linear; spores 6–11 μ in length. 22. *U. chloridicola.*
Sori in spikelets.
Sori rather completely destroying spikelets.
Hosts: *Avena.* 9. *U. Avenae.*
Hosts: *Triticum.* 11. *U. Tritici.*
Hosts: *Hordeum.* 10. *U. nuda.*
Sori destroying inner and basal parts. 8. *U. perennans.*
Sori in ovaries.
Spores evidently echinulate or verruculose.
Spores variable, often elongated, olive-brown. 24. *U. olivacea.*
Spores rather regular, reddish-brown. 27. *U. sparsa.*
Spores obscurely echinulate, often appearing smooth.
Spores uniformly colored, 4–6 μ in length. 25. *U. Sieglingiae.*
Spores often lighter colored on one side, 5–9 μ. 26. *U. Triplasidis.*
Spores medium, 9–14 μ in length (see also nos. 21, 47).
Sori on various parts of host.
Sori at nodes and on leaves, nodular, hispid. 36. *U. Crus-galli.*
Sori in ovaries, nodes, etc., pustular, smooth. 34. *U. pustulata.*
Sori usually at nodes, conspicuous, ovate to lanceolate. 37. *U. heterogena.*
Sori on any part of host, usually very conspicuous. 38. *U. Zeae.*
Sori forming elongate outbreaks, aborting inflorescence. 39. *U. Kellermanii.*
Sori in leaves.
Sori in striae. 53. *U. striaeformis.*
Sori involving leaves at apex of culm and aborting inflorescence.
Sori linear, very elongate, often 1 dm. 52. *U. Dieteliana.*
Sori elongate-ellipsoidal, 5–10 mm. 48. *U. Aegopogonis.*
Sori in inflorescence (see also nos. 39, 48, 52).
Hosts: *Syntherisma* (*Panicum*). 46. *U. Rabenhorstiana.*
Hosts: *Chloris.* 51. *U. elegans.*
Sori in spikelets, infecting entire spike. 40. *U. neglecta.*
Sori in ovaries (see also no. 34).
Sori conspicuous, chiefly 3–6 mm., hispid. 35. *U. sphaerogena.*
Sori rather inconspicuous, 1–4 mm. in length.
Spores echinulate.
Hosts: *Eragrostis.* 28. *U. spermophora.*
Hosts: *Bouteloua.* 29. *U. Boutelouae.*
Hosts: *Tridens* (*Tricuspis*). 30. *U. Tricuspidis.*
Spores minutely and obscurely verruculose. 41. *U. Uniolae.*
Spores very conspiculously echinulate. 43. *U. ornata.*
Spores with coarse, often acute tubercles. 44. *U. Sporoboli.*
Sori very inconspicuous, 1 mm. or less. 42. *U. Eriocauli.*
Spores large, 14–18 μ, rarely 12 μ, in length.
Sori in leaves.
Sori forming oblong pustules.
Spores smooth or obscurely verruculose. 33. *U. Buchloes.*
Spores echinulate. 32. *U. Hieronymi.*
Sori forming linear striae; spores verrucose. 54. *U. Calamagrostidis.*
Sori in inflorescence.
Spores light reddish-brown, minutely echinulate. 49. *U. Hilariae.*
Spores prominently echinulate; sorus with columella. 47. *U. Holwayana.*
Spores dark reddish-brown, verruculose.
Hosts: *Sporobolus.* 45. *U. Vilfae.*
Hosts: *Festuca.* 50. *U. Mulfordiana.*
4. Spores coarsely verrucose to occasionally semi-reticulate.
Sori on leaves.
Hosts: *Agropyron, Elymus,* etc. 55. *U. macrospora.*
Hosts: *Phalaris.* 56. *U. echinata.*
Hosts: *Panicularia* (*Glyceria*), *Scolochloa.* 57. *U. Arthurii.*

B. Spores yellow or golden-brown.

Spores smooth or obscurely echinulate, 7–12 μ in length.	59. *U. Vaillantii.*
Spores coarsely verrucose, 13–20 μ in length.	60. *U. Oxalidis.*

C. Spores violet or purplish.

Spores very minutely and obliquely striate.	
Hosts: *Macounastrum* (*Koenigia*).	69. *U. Koenigiae.*
Hosts: *Polygonum*.	70. *U. Piperii.*
Spores minutely verruculose.	72. *U. Bistortarum.*
Spores though appearing smooth very minutely pitted-reticulate.	71. *U. punctata.*
Spores with winged reticulations.	
Sori in stems, petioles and midribs.	68. *U. Parlatorei.*
Sori in inflorescence and floral axis.	67. *U. Rumicis.*
Sori in flowers or their organs.	
Sori in ovaries and often stamens, inclosed by floral envelopes.	
Spores small, 7–10 μ, minutely reticulate (1 μ).	61. *U. vinosa.*
Spores medium, 10–14 μ in length.	
Spores light-violet, rather finely reticulate (1–3 μ).	65. *U. anomala.*
Spores purplish; reticulations coarser (2–4 μ).	66. *U. utriculosa.*
Spores medium large, 14–17 μ; reticulations 1.5–2 μ.	64. *U. Calandriniae.*
Sori in anthers.	62. *U. violacea.*
Sori in seeds; spores 12–18 μ; reticulations about 1 μ.	63. *U. Gayophyti.*

1. **Ustilago minima** Arth. Bull. Iowa Agr. Coll. Dep. Bot. **1884**: 172. 1884.

Sori on stems, linear, usually 3–5 cm. in length, with a conspicuous whitish false membrane composed chiefly of elongated sterile fungous threads, upon rupture disclosing a dusty black-brown spore-mass surrounding stem as columella; spores light reddish-brown, chiefly ovoid to subspherical or spherical, smooth, 3.5–4.5 μ, or elongate, 5.5 μ, in length.

ON POACEAE:
Eriocoma cuspidata (*Oryzopsis cuspidata*), Arizona.
Stipa spartea, Iowa, South Dakota.
TYPE LOCALITY: Ames, Iowa, on *Stipa spartea*.
DISTRIBUTION: Iowa, South Dakota and Arizona.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 70*; Griff. West Am. Fungi *237*.

2. **Ustilago hypodytes** (Schlecht.) Fries, Syst. Myc. **3**: 518. 1832.

Caeoma hypodytes Schlecht. Fl. Berol. **2**: 129. 1824.
Ustilago Sporoboli Ellis & Ev. Bull. Torrey Club **24**: 282. 1897. (Type from Colorado, on *Sporobolus cryptandrus*.) Not *U. Sporoboli* Tracy & Earle, 1896.
Ustilago funalis Ellis & Ev. Bull. Torrey Club **24**: 457. 1897.
Sorosporium Williamsii Griff. Bull. Torrey Club **29**: 296. 1902. (Type from Wyoming, on *Stipa Richardsonii*.)

Sori surrounding internodes (beginning at their bases) for usually the greater part of their length, linear, hidden by enveloping leaf-sheaths but without special covering membrane, when mature forming a dusty dark-brown spore-mass; spores ovoid to spherical, occasionally slightly polyhedral or irregular, smooth, often guttulate, chiefly 4–7 μ in length.

ON POACEAE:
Agropyron occidentale, Montana, South Dakota.
Distichlis spicata (*D. maritima*), Arizona, California, Connecticut, Nevada, New Mexico, Oregon, Texas, Washington.
Elymus canadensis, Iowa.
Elymus condensatus, California, Nevada, Oregon, Washington.
Elymus glaucus, California.
Elymus striatus, Montana.
Eriocoma cuspidata (*Oryzopsis cuspidata*), Colorado.
Poa Buckleyana, Nevada.
Puccinellia airoides, California.
Sitanion longifolium, California, Washington.
Sporobolus cryptandrus, Colorado.
Sporobolus sp., California.
Stipa comata, Montana, Nebraska, Washington.
Stipa coronata, California.
Stipa eminens, California.
Stipa occidentalis, Oregon.
Stipa Richardsonii, Wyoming.
Stipa setigera, California, Texas.
Stipa spartea, Illinois, South Dakota.
Stipa Vaseyi, New Mexico.
Stipa viridula, South Dakota.
Stipa sp., Utah, Washington.

TYPE LOCALITY: Vicinity of Berlin, Germany, on *Elymus arenarius*.
DISTRIBUTION: Connecticut; Illinois to Texas, California, and Washington; also in South America, Europe, Asia, and Africa.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 3, f. 14;* Bull. Torrey Club **29**: 291, *f. 5;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*15*), *117;* Rev. Myc. **12**: *pl. 19, f. 275, 276;* Flora **83**: *pl. 3, f. 7;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 1.*
EXSICCATI: Griff. West Am. Fungi *3, 201, 233, 234, 235, 236, 306;* Seym. & Earle, Econ. Fungi *C 71;* Ellis & Ev. N. Am. Fungi *3135;* Ellis & Ev. Fungi Columb. *537, 1899;* Sydow, Ust. *210.*

3. **Ustilago longissima** (Sow.) Tul. Ann. Sci. Nat. III. **7**: 76. 1847.

Lycoperdon filiforme Schrank, Bot. Tasch. Hoppe **1793**: 69. 1793. (Type from Bavaria, on *Poa aquatica.*)
Uredo longissima Sow. Engl. Fungi *pl. 139.* 1798.
Ustilago filiformis Rostr. Fests. Bot. For. Kjøb. 136. 1890.

Sori in leaves, forming more or less distinct and linear groups from a few mm. to length of the leaf, soon rupturing epidermal covering and the reddish-brown spore-mass becoming scattered from the more or less shredded tissues; spores light-brown, oblong or ellipsoidal to spherical, smooth or scarcely granular under an immersion, 4–8 μ in length.

ON POACEAE:
Panicularia americana (*Glyceria grandis*), Connecticut, Iowa, Massachusetts, Michigan, Minnesota, New York, Vermont, Wisconsin.
Panicularia (*Glyceria*) sp., New Hampshire.
TYPE LOCALITY: Lambeth Marsh, England, on *Poa aquatica* (*Panicularia aquatica*).
DISTRIBUTION: New England to Minnesota and Iowa; also in South America, Europe, and Asia.
ILLUSTRATIONS: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 1;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*17*); Brefeld, Unters. Gesammt. Myk. **5**: *pl. 8, pl. 9, f. 8–16;* Rev. Myc. **12**: *pl. 19, f. 282–284;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 2;* Plowright, Brit. Ured. Ust. *pl. 7, f. 14–16.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *1096;* Ellis & Ev. Fungi Columb. *469;* Seym. & Earle, Econ. Fungi *541, C 73, C 74.*

Ustilago longissima macrospora Davis, Trans. Wisc. Acad. **11**: 174. 1897. Spores similar, somewhat more irregular and angled, apparently smooth but under an immersion minutely granular, 7–12 μ in length. ON POACEAE: *Panicularia fluitans* (*Glyceria fluitans*), Illinois, Maine, Wisconsin. *Panicularia laxa* (*G. laxa*), Maine. EXSICCATI: Ellis & Ev. N. Am. Fungi *3235;* Seym. & Earle, Econ. Fungi *540, C 75;* Sydow, Ust. *253.*

4. **Ustilago calcara** Griff. Bull. Torrey Club **31**: 85. 1904.

Sori in the leaf-sheaths, occasionally in the blades, extending between the veins and rupturing upon the exterior, circular, 0.5 mm. in diameter, or linear through confluence and then often 5 mm. or more in length; spores light to dark reddish-brown, irregular, ovate to subspherical, often pointed, with thin smooth walls, chiefly 8–11 μ in length.

ON POACEAE:
Bouteloua breviseta, New Mexico.
TYPE LOCALITY: Roswell, New Mexico, on *Bouteloua breviseta.*
DISTRIBUTION: New Mexico.
ILLUSTRATION: Bull. Torrey Club **31**: 85, *f. 8.*

5. **Ustilago mexicana** Ellis & Ev. Jour. Myc. **3**: 56. 1887.

Sori in the individual spikelets usually infecting all, ovate, small, about 1 mm. in length, more or less concealed by the enveloping glumes; spores reddish-brown, often lighter-colored on one side due in part to the thinner wall, ovoid to spherical or somewhat angular and irregular, smooth, 5.5–8 μ in length.

ON POACEAE:
Muhlenbergia sp., Mexico.
TYPE LOCALITY: Mountains near Batopilas, Mexico, on *Muhlenbergia* sp.
DISTRIBUTION: Mexico.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1891.*

6. **Ustilago Hordei** (Pers.) Kellerm. & Swingle, Ann. Rep. Kan. Agr. Exp. Sta. **2**: 268. 1890.

Uredo segetum Hordei Pers. Tent. Disp. Fung. 57. 1797.
Ustilago Hordei tecta Jens. Charb. Céréales 4. 1889.
Ustilago Jensenii Rostr. Overs. K. Danske Vid. Selsk. Forh. **1890**: 12. 1890.

Sori in spikelets, forming an adhering purple-black spore-mass, about 6–10 mm. in length, covered rather permanently by the transparent basal parts of the glumes; spores

lighter-colored on one side, usually subspherical or spherical, smooth, 5–9 μ, the most elongate rarely 9–11 μ, in length.

ON POACEAE:
Hordeum spp. cult., California, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Mississippi, Missouri, New Hampshire, New York, North Carolina, North Dakota, Ohio, Oregon, South Dakota, Vermont, Washington, Wisconsin; Canada; Nova Scotia; Mexico.
TYPE LOCALITY: Europe, on *Hordeum* sp. cult.
DISTRIBUTION: Coextensive with the cultivation of barley.
ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. E;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 46;* Ann. Rep. Kan. Agr. Exp. Sta. 2: *pl. 2, f. 3–6, pl. 7;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114 (12);* Brefeld, Unters. Gesammt. Myk. 12: *pl. 7, f. 33–35;* Tubeuf, Diseases Pl. *f. 159.*
EXSICCATI: Seym. &. Earle, Econ. Fungi *82[b], C 69;* Ellis & Ev. Fungi Columb. *1484;* Kellerm. Ohio Fungi *40;* Griff. West Am. Fungi *23, 23[a];* Ellis, N. Am. Fungi *1091.*

7. **Ustilago levis** (Kellerm. & Swingle) Magn. Abh. Bot. Ver. Prov. Brand. **37**: 69. 1896.

Ustilago Avenae levis Kellerm. & Swingle, Ann. Rep. Kan. Agr. Exp. Sta. **2**: 259. 1890.
? *Ustilago Kolleri* Wille, Bot. Notiser **1893**: 10. 1893. (Type from Norway, on *Avena sativa.*)

Sori in spikelets, forming a black-brown adhering spore-mass, sometimes small and entirely concealed by the glumes but usually evident and destroying inner and basal parts; spores lighter-colored on one side, subspherical to spherical or rarely more elongate, smooth, 5–9 μ, the most elongate rarely 11 μ, in length.

ON POACEAE:
Avena sativa, Connecticut, Illinois, Iowa, Kansas, Maine, New Hampshire, North Carolina, Ohio, South Dakota, Utah, Washington, West Virginia, Wisconsin; Nova Scotia.
TYPE LOCALITY: Kansas, on *Avena sativa.*
DISTRIBUTION: Nova Scotia to North Carolina, Utah, and Washington; also in Europe.
ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. A7, B, S3–4;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 45;* Bull. Kan. Agr. Exp. Sta. 15: *pl. II.*
EXSICCATI: Griff. West Am. Fungi *27;* Seym. & Earle, Econ. Fungi *C 72;* Ellis, Ev. & Barth. Fungi Columb. *1996;* Ellis, N. Am. Fungi *1092, p. p.*

8. **Ustilago perennans** Rostr. Overs. K. Danske Vid. Selsk. Forh. **1890**: 15. Mr 1890.

Cintractia Avenae Ellis & Tracy, Jour. Myc. **6**: 77. S 1890. (Type from Mississippi, on *Arrhenatherum elatius.*)

Sori in spikelets, more or less destroying the basal and inner parts, sometimes even running down on pedicels, oblong, about 3–8 mm. in length, with dusty, olive-brown spore-mass; mycelium perennial in perennial parts of host; spores chiefly subspherical or spherical, occasionally ovate to ellipsoidal, usually lighter-colored on one side, more or less minutely echinulate especially on the lighter side, 5–8 μ in length.

ON POACEAE:
Arrhenatherum elatius (*A. avenaceum*), Connecticut, Illinois, Indiana, Iowa, Mississippi, New York, Ohio, Vermont, Wisconsin.
TYPE LOCALITY: Europe, on *Avena elatior* (*Arrhenatherum elatius*).
DISTRIBUTION: New England to Iowa and Mississippi; also in Europe and Asia.
ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. C;* Bull. Iowa Agr. Exp. Sta. 54: *f. 119;* Brefeld, Unters. Gesammt. Myk. 12: *pl. 7, f. 25–28;* Tubeuf, Diseases Pl. *f. 157–158.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *1893[b], 2703;* Seym. & Earle, Econ. Fungi *83, C 83.*

9. **Ustilago Avenae** (Pers.) Jens. Charb. Céréales 4. 1889.

Uredo segetum Avenae Pers. Tent. Disp. Fung. 57. 1797.
Ustilago segetum Avenae Jens. Om Korns. Brand 61. 1888.
Ustilago Avenae f. *folicola* Almeida, Revista Agron. **1**: 20. 1903.

Sori in spikelets, forming a dusty olive-brown spore-mass, about 6–12 mm. long by half as wide, usually rather completely destroying floral parts, eventually becoming dissipated, rarely in leaves; spores lighter-colored on one side, subspherical to spherical though often more elongate, minutely echinulate, 5–9 μ in length.

ON POACEAE:
Avena fatua, California.
Avena sativa, Alabama, California, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North

Dakota, Ohio, Oklahoma, Rhode Island, South Dakota, Tennessee, Texas, Vermont, Washington, West Virginia, Wisconsin, Wyoming; Nova Scotia.

TYPE LOCALITY: Europe, on *Avena sativa*.

DISTRIBUTION: Coextensive with the cultivation of oats.

ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. A3, S1–2;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 43;* Bull. Kan. Agr. Exp. Sta. 8: *pl. 1–2;* Ann. Rep. Kan. Agr. Exp. Sta. **2**: *pl. 1, 4, 5;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114 (13);* Brefeld, Unters. Gesammt. Myk. **11**: *pl. 1, f. 1–4;* Ann. Rep. Mass. State Agr. Exp. Sta. **9**: 248, *pl. 1, f. 1;* Tubeuf, Diseases Pl. *f. 156*.

EXSICCATI: Seym. & Earle, Econ. Fungi *81, C 64;* Shear, N. Y. Fungi *82;* Ellis & Ev. Fungi Columb. *539;* Ellis, N. Am. Fungi *1092, p. p.;* Rav. Fungi Car. II. *99*.

10. **Ustilago nuda** (Jens.) Kellerm. & Swingle, Ann. Rep. Kan. Agr. Exp. Sta. **2**: 277. 1890.

Ustilago Hordei nuda Jens. Charb. Céréales 4. 1889.
Ustilago Hordei Rostr. Overs. K. Danske Vid. Selsk. Forh. **1890**: 10. 1890.
Ustilagidium Hordei Herzb. in Zopf, Beitr. Phys. Morph. Org. **5**: 7. 1895.

Sori in spikelets, forming a dusty olive-brown spore-mass, about 6–10 mm. long by half as wide, temporarily protected by a thin membrane but soon becoming dissipated and leaving the naked rachis behind; spores lighter-colored on one side, minutely echinulate, subspherical to spherical or occasionally more elongate, 5–9 μ in length.

ON POACEAE:

Hordeum spp. cult., Connecticut, Illinois, Iowa, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New York, North Carolina, Ohio, South Dakota, Texas, Wisconsin; Nova Scotia; Mexico.

TYPE LOCALITY: Europe, on *Hordeum* sp. cult.

DISTRIBUTION: Coextensive with the cultivation of barley in America and Europe.

ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. D;* Bull Conn. Geol. Nat. Hist. Surv. 5: *f. 47;* Ann. Rep. Kan. Agr. Exp. Sta. **2**: *pl. 2, f. 7–11, pl. 8;* Bull. Iowa Exp. Sta. 54: *f. 114 (18);* Ann. Rep. Mass. State Agr. Exp. Sta. **9**: 248, *pl. 1, f. 2*.

EXSICCATI: Seym. & Earle, Econ. Fungi *82a, C 77, C 78;* Ellis, Ev. & Barth. Fungi Columb. *2193*.

11. **Ustilago Tritici** (Pers.) Rostr. Overs. K. Danske Vid. Selsk. Forh. **1890**: 15. Mr 1890.

Uredo segetum Tritici Pers. Tent. Disp. Fung. 57. 1797.
Ustilago segetum Tritici Jens. Om Korns. Brand 61. 1888.
Ustilago Tritici Jens.; Kellerm. & Swingle, Ann. Rep. Kan. Agr. Exp. Sta. **2**: 262. Je 1890.
Ustilago Tritici f. *folicola* P. Henn. Zeits. Pflanzenk. **4**: 139. 1894.
Ustilagidium Tritici Herzb. in Zopf, Beitr. Phys. Morph. Org. **5**: 7. 1895.

Sori in spikelets, forming a dusty olive-brown spore-mass, about 8–12 mm. long by half as wide, usually entirely destroying floral parts and eventually becoming dissipated and leaving behind only the naked rachis; spores lighter-colored on one side, usually subspherical to spherical, occasionally more elongate, minutely echinulate especially on the lighter side, 5–9 μ in length.

ON POACEAE:

Triticum vulgare, Alabama, Idaho, Illinois, Indiana, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Texas, Vermont, Washington, West Virginia, Wisconsin, Wyoming; Mexico.

TYPE LOCALITY: Europe, on *Triticum vulgare*.

DISTRIBUTION: Coextensive with the cultivation of wheat.

ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. F 1–2, R 2, S 5;* E. & P. Nat. Pfl. 1^{1**}: 9, *f. 5A;* Ann. Rep. Kan. Agr. Exp. Sta. **2**: *pl. 2, f. 1–2, pl. 6;* Ann. Rep. Mass. State Agr. Exp. Sta. **9**: 248, *pl. 1, f. 3;* Tubeuf, Diseases Pl. *f. 160*.

EXSICCATI: Underw. & Cook, Illustr. Fungi *56;* Seym. & Earle, Econ. Fungi *80;* Ellis & Ev. Fungi Columb. *1369;* Sydow, Ust. *167;* Kellerm. Ohio Fungi *42;* Griff. West Am. Fungi *22*.

12. **Ustilago Muhlenbergiae** P. Henn. Hedwigia Beibl. **41**: 61. Ap 1902.

Ustilago Muhlenbergiae Clinton, Jour. Myc. **8**: 133. O 1902. (Type from Arizona, on *Muhlenbergia texana*.)

Sori in the abortive inflorescence, ovoid to subspherical, about 3–6 mm. in length, protected by thin semitransparent membrane of the infected floral parts, upon rupture disclosing a black-brown dusty spore-mass; spores rather dark reddish-brown, chiefly spherical, at first apparently smooth, but with age or approaching germination splitting off caps on

opposite sides of epispore and these eventually breaking up into small granular echinulations thus leaving a dark, less broken central band, 4–6 μ in diameter.

ON POACEAE:
Muhlenbergia Porteri (*M. texana*), Arizona.
Muhlenbergia Pringlei, New Mexico.
TYPE LOCALITY: Hot Springs, New Mexico (not Mexico, as stated), on *Muhlenbergia Pringlei*.
DISTRIBUTION: New Mexico and Arizona.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 142*.

13. **Ustilago residua** Clinton, Jour. Myc. **8**: 133. 1902.

Ustilago segetum f. *Danthoniae* Ellis & Ev. N. Am. Fungi *1893a*; hyponym. 1887.

Sori in the inflorescence, prominent, infecting the whole or sometimes confined to the individual spikelets, usually enclosed by leaf-sheaths, on exposure showing as an olive-brown dusty spore-mass; spores rather light olive-brown, ovoid or ovate to spherical or occasionally irregular, thin-walled, with coarse granules giving granular-reticulate appearance under an immersion, usually 5.5–8.5 μ, sometimes even 11 μ, in length.

ON POACEAE:
Danthonia californica, California.
Danthonia compressa, New York.
Danthonia intermedia, California, Wyoming.
Danthonia spicata, New Hampshire.
Danthonia unispicata, California.
Danthonia sp., Colorado.
TYPE LOCALITY: New Hampshire, on *Danthonia spicata*.
DISTRIBUTION: New Hampshire, New York, Colorado, Wyoming, and California; also in Australia.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 146*; Ellis & Ev. N. Am. Fungi *1893a*.

14. **Ustilago affinis** Ellis & Ev.; Cockerell, Bull. Torrey Club **20**: 297. 1893.

Ustilago Hilariae P. Henn. Hedwigia **37**: 267. 1898. (Type from Mexico, on *Hilaria cenchroides*.) Not *U. Hilariae* Ellis & Tracy. 1890.
Ustilago Stenotaphri P. Henn. Hedwigia **37**: 293. 1898. (Type from Cape Colony, on *Stenotaphrum glabrum*.) Not *U. Stenotaphri* McAlpine. 1895.
Ustilago americana Speg. Anal. Mus. Nac. Buenos Aires **6**: 207. 1899. (Type from La Plata, Argentina, on *Stenotaphrum glabrum*.)
Ustilago Stenotaphri Massee, Kew Bull. **1899**: 184. 1899. (Type from Bermuda, on *Stenotaphrum glabrum*.)
Ustilago Henningsii Sacc. & Sydow; Sacc. Syll. Fung. **16**: 368. 1902.

Sori in spikelets, usually infecting all, which are sometimes slightly merged, at first more or less hidden by enveloping leaves, protected by a thin transparent membrane but this soon rupturing and the olive-brown spore-mass scattering until there remains only the naked rachis; spores light reddish-brown, oblong or ovate to chiefly subspherical or spherical, often slightly angled, smooth, 5.5–9 μ in length.

ON POACEAE:
Hilaria cenchroides, Mexico.
Stenotaphrum secundatum (*S. americanum*), Bermuda, Jamaica.
TYPE LOCALITY: Mandeville, Jamaica, on *Stenotaphrum americanum* (*S. secundatum*).
DISTRIBUTION: Bermuda, Jamaica, and Mexico; also in South America and Africa.

15. **Ustilago Lorentziana** Thüm. Flora **63**: 30. 1880.

Ustilago Holwayi Dietel, Bot. Gaz. **18**: 253. 1893. (Type from California, on *Hordeum pratense*.)

Sori in spikelets, usually infecting all of a spike, rather completely destroying their parts except the awns, protected at first by a thin transparent membrane which easily ruptures disclosing a dusty purple-black spore-mass; spores rather dark olive-brown, ovoid to spherical or sometimes with more irregular and angular forms, with a brittle epispore that breaks up into more or less irregular granules or minute verruculations, chiefly 7–12 μ in length.

ON POACEAE:
Hordeum caespitosum, Utah.
Hordeum jubatum, Montana, North Dakota, South Dakota, Utah.
Hordeum maritimum, Idaho.
Hordeum murinum, California.
Hordeum nodosum (*H. pratense*), California, Utah.
Hordeum pusillum, California.
Hordeum sp., California, Washington.

TYPE LOCALITY: Argentina, on *Hordeum compressum*.
DISTRIBUTION: North Dakota to Washington and California; also in South America.
EXSICCATI: Sydow, Ust. *9*, *154*, *206*, *305*; Ellis & Ev. Fungi Columb. *1281*, *2098*; Ellis & Ev. N. Am. Fungi *2702*; Griff. West Am. Fungi *192*; Seym. & Earle, Econ. Fungi *C 140*.

16. **Ustilago bromivora** (Tul.) Fisch. de Waldh. Bull. Soc. Nat. Mosc. **40**[1]: 252. 1867.

Ustilago Carbo vulgaris bromivora Tul. Ann. Sci. Nat. III. **7**: 81. 1847.
Cintractia patagonica Cooke & Massee, Grevillea **18**: 34. 1889. (Type from Patagonia, on *Bromus unioloides*.)

Sori in spikelets, usually infecting only the parts within the glumes but sometimes also destroying the base of these, often at first agglutinated but finally becoming dusty; spores usually dark reddish-brown, chiefly ovoid to spherical but occasionally polyhedral or irregular, sometimes apparently smooth or only granular, but usually abundantly and minutely granular-verruculose, 7–11 μ, rarely 14 μ, in length.

ON POACEAE:
Bromus arvensis, Colorado?
Bromus breviaristatus, California, Iowa.
Bromus ciliatus, Colorado.
Bromus Hookerianus, California, Washington.
Bromus hordeaceus (*B. mollis*), California, Washington.
Bromus hordeaceus glabrescens, Washington.
Bromus Kalmii, Utah.
Bromus marginatus, California, Colorado, District of Columbia, Iowa, Oregon, Wyoming.
Bromus polyanthus, Utah.
Bromus Pumpellianus, District of Columbia.
Bromus racemosus, Washington.
Bromus Richardsoni District of Columbia.
Bromus secalinus, California, Oregon.
Bromus vulgaris, Montana, Washington.
Bromus vulgaris eximius, Washington.
Bromus sp., Montana, Utah.
TYPE LOCALITY: Europe, on *Bromus secalinus*.
DISTRIBUTION: District of Columbia (on cultivated plants); Iowa to Washington and California; also in South America, Europe, Asia, and Australia.
ILLUSTRATIONS: Bull. Iowa Agr. Exp. Sta. 54: *f. 114 (4)*; Brefeld, Unters. Gesammt. Myk. **5**: *pl. 10*, *f. 1–8*; Rev. Myc. **12**: *pl. 19*, *f. 280–281*; Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3*, *f. 15*.
EXSICCATI: Ellis & Ev. N. Am. Fungi *3052*; Sydow, Ust. *102*, *202*, *303*; Griff. West Am. Fungi *204*, *205*, *206*, *206a*; Ellis & Ev. Fungi Columb. *536*, *1995*; Seym. & Earle, Econ. Fungi *534*, *C 65*, *C 136*, *C 137*, *C 138*.

Ustilago bromivora macrospora Farl. Bull. Iowa Agr. Coll. Bot. Dep. **1886**: 59. 1887. Spores somewhat more irregular and larger, chiefly 11–17 μ in length. ON POACEAE: *Bromus ciliatus*, Colorado; ? Iowa.

17. **Ustilago Crameri** Körn.; Fuckel, Jahrb. Nass. Ver. Nat. **27–28**: 11. 1873.

Sori in the spikelets, infecting all of the spike, ovate, about 2–4 mm. in length, chiefly destroying inner and basal parts; spores reddish-brown, chiefly ovoid to subspherical though occasionally more elongate and irregular, smooth, with usually pitted contents, chiefly 8–11 μ in length.

ON POACEAE:
Chaetochloa italica (*Setaria italica*), Connecticut, District of Columbia, Illinois, Indiana, Iowa, Maine, Michigan, Ohio, North Dakota, South Dakota.
TYPE LOCALITY: Switzerland, on *Setaria italica* (*Chaetochloa italica*).
DISTRIBUTION: New England to Illinois and South Dakota; also in Europe.
ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. P*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 44*; Brefeld, Unters. Gesammt. Myk. **5**: *pl. 7*, *f. 18–21*.
EXSICCATI: Griff. West Am. Fungi *9*; Seym. & Earle, Econ. Fungi *C 66*, *C 139*.

18. **Ustilago lycuroides** Griff. Bull. Torrey Club **31**: 84. 1904.

Sori in the ovaries, infecting only part of the spikelets, evident, spherical, about 1.5 mm. in diameter, covered with a greenish membrane bearing remains of styles at its apex, upon rupture disclosing a compact, dusty, black-brown spore-mass; spores clear reddish-brown, ovoid to subspherical, smooth but because of clear granular contents often appearing pitted, chiefly 10.5–14 μ in length.

ON POACEAE:
Lycurus phleoides, Arizona.
TYPE LOCALITY: One mile north of Greaterville on road to Rosemont, Santa Rita Mountains, Arizona, on *Lycurus phleoides*.
DISTRIBUTION: Arizona.
ILLUSTRATION: Bull. Torrey Club **31**: 85, *f. 11, 12.*

19. **Ustilago Rickerii** Clinton, sp. nov.

Sori in the ovaries, apparently infecting all in the inflorescence, ovoid to subspherical, about 3–6 mm. in length, covered by a smooth membrane of plant tissue that upon rupture discloses the olive-black dusty spore-mass; spores reddish-brown, ovoid to chiefly subspherical or spherical, contents usually guttulate, apparently smooth, but under an immersion lens usually minutely and sparsely granular-echinulate, 5.5–9 μ in length.

ON POACEAE:
Panicum paspaloides, Cuba.
Type collected in Batabano, Cuba, March, 1906, by A. S. Hitchcock, and communicated by P. L. Ricker as an interesting species.

20. **Ustilago Panici-proliferi** P. Henn. Bot. Gaz. **28**: 274. 1899.

Sori in the inner folded leaves and possibly also aborting the inflorescence, elongate, chiefly 3–8 cm. in length, often thickest at base, more or less enveloped by leaf-sheaths, covered with a thin transparent membrane that soon ruptures, exposing the dusty olive-black spore-mass surrounding the prominent, elongate remains of the plant tissues; spores olive-brown, chiefly ovoid to spherical, contents often punctate, smooth, 7–10 μ in length.

ON POACEAE:
Panicum paspaloides, Mexico.
Panicum proliferum acuminatum, Mexico.
TYPE LOCALITY: City of Mexico, on *Panicum proliferum acuminatum*.
DISTRIBUTION: Mexico.
EXSICCATI: Sydow, Ust. *212*; Seym. & Earle, Econ. Fungi *C 143.*

21. **Ustilago Ulei** P. Henn. Hedwigia **34**: 88. 1895.

Sori in the leaves, rather indefinite, in striae or often involving more or less of the inner surface of the blades as folded together, eventually causing them to become somewhat shredded and the olive-black dusty spore-mass to become scattered; spores reddish-brown, often with thin walls (such spores easily collapsing when dry), usually subspherical or spherical, smooth or very minutely punctate-verruculose, 8–11 μ in diameter.

ON POACEAE:
Chloris submutica, Mexico.
TYPE LOCALITY: Goyaz, Brazil, on *Chloris* sp.
DISTRIBUTION: Mexico; also in South America.
ILLUSTRATION: Brefeld, Unters. Gesammt. Myk. **12**: *pl. 7, f. 14–18.*

22. **Ustilago chloridicola** P. Henn. Hedwigia **37**: 267. 1898.

Sori in the inflorescence, linear, often about 3 cm. in length, causing more or less shredding of the infected tissues, with dusty olive-black spore-mass that becomes scattered; spores reddish-brown, often irregular, oblong or elliptical to spherical, apparently minutely verruculose, but punctate-reticulate under an immersion lens, 6–11 μ in length.

ON POACEAE:
Chloris sp., California.
TYPE LOCALITY: Potter Valley, Mendocino County, California, on *Chloris* sp.
DISTRIBUTION: California.

23. **Ustilago Tillandsiae** Patters.; Clinton, Jour. Myc. **8**: 135. 1902.

Sori destroying inner flower parts, protected by enclosing bracts and perianth, forming an irregular dusty black spore-mass about 1–3 cm. in length; spores olive-brown, chiefly ovoid to spherical, thin-walled, more or less collapsed or hemispherically cupped, smooth or with brittle epispore breaking up into thin polygonal areas, 7–13 μ in length.

ON BROMELIACEAE:
Tillandsia Leiboldiana, Mexico.
Tillandsia sp., Costa Rica.
TYPE LOCALITY: Costa Rica, on *Tillandsia* sp.
DISTRIBUTION: Mexico and Costa Rica.

24. **Ustilago olivacea** (DC.) Tul. Ann. Sci. Nat. III. **7**: 88. 1847.

Uredo olivacea DC. Fl. Fr. **6**: 78. 1815.
Ustilago caricicola Tracy & Earle, Bull. Torrey Club **26**: 493. 1899. (Type from Mississippi, on *Carex folliculata*.)

Sori in occasional ovaries, often at first more or less concealed by perigynium, forming rounded bodies 2–6 mm. in diameter, at first with firmly agglutinated spore-mass but finally more or less dusty, usually with conspicuous threads intermingled with the spores; spores light olive-brown, usually irregular, varying from linear to oblong or subspherical, but in some instances more regular and then chiefly subspherical or spherical, very minutely verruculose, usually 5–9 μ, but the most elongate occasionally 14 μ, in length.

ON CYPERACEAE:
Carex cladostachya (*C. polystachya*), Mexico.
Carex folliculata australis, Mississippi.
Carex turgescens, Florida.
Carex utriculata, Washington, Wisconsin.
Carex sp., Mexico, Jamaica.
TYPE LOCALITY: France, on *Carex riparia*.
DISTRIBUTION: Wisconsin to Washington, Florida, Mexico and Jamaica; also in South America, Europe, and Asia.
ILLUSTRATIONS: Brefeld, Unters. Gesammt. Myk. **5**: *pl. 10, f. 9–26;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 11.*

25. **Ustilago Sieglingiae** Ricker, Jour. Myc. **11**: 112. 1905.

Sori in ovaries, infecting all, ellipsoidal, about 2–4 mm. in length, protected by thin membrane and enveloping glumes, finally shedding the dusty dark-brown spore-mass; spores rather uniformly colored, medium-dark reddish-brown, ellipsoidal to chiefly subspherical or spherical, occasionally more elongate or irregular, smooth or very minutely and obscurely echinulate, 4–6 μ, or the most elongate 7 μ, in length.

ON POACEAE:
Triplasis purpurea, Florida.
TYPE LOCALITY: Punta Rassa, Florida, on *Sieglingia purpurea* (*Triplasis purpurea*).
DISTRIBUTION: Florida.

26. **Ustilago Triplasidis** Ellis & Ev.; Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 355. 1904.

Sori in ovaries, ellipsoidal, about 3–4 mm. in length, protected by thin membrane, showing between the glumes of most of the spikelets; spores light reddish-brown, often lighter-colored on one side, ovoid to chiefly subspherical or spherical, usually abundantly but very minutely echinulate, 5–9 μ in length.

ON POACEAE:
Triplasis americana, Mississippi.
TYPE LOCALITY: Deer Island, Biloxi, Mississippi, on *Triplasis americana*.
DISTRIBUTION: Mississippi.

27. **Ustilago sparsa** Underw. Bull. Torrey Club **24**: 86. 1897.

Sori in the ovaries, ovate, usually infecting few of the spikelets, about 2–3 mm. in length, with rupture of the covering disclosing a dusty brown-black spore-mass; spores light reddish-brown, ovoid or ovate to spherical, distinctly echinulate, chiefly 6–10 μ in length.

ON POACEAE:
Dactyloctenium aegyptium, Alabama, South Carolina.
TYPE LOCALITY: Auburn, Alabama, on *Dactyloctenium aegyptium*.
DISTRIBUTION: Alabama and South Carolina.
EXSICCATI: Rav. Fungi Am. *790;* Seym. & Earle, Econ. Fungi *C 86*.

28. **Ustilago spermophora** B. & C.; (Ellis, N. Am. Fungi *1098;* hyponym. 1883) Sacc. Syll. Fung. **7**[2]: 466. 1888.[1]

Sori in the ovaries, usually infecting only a few in the spikelets, ovate, small, 1–2 mm. in length, sometimes bearing remains of unaffected part of ovary at apex, protected by a

[1] Listed in Curt. Cat. Pl. N. Car. 123, in 1867.

thin membrane; spores light-brown, ovoid to subspherical, usually prominently echinulate, 8–13 μ in length.

ON POACEAE:
Eragrostis hypnoides (*E. reptans*), District of Columbia, South Dakota, Wisconsin.
Eragrostis major, Connecticut, Delaware, Illinois, Indiana, Iowa, Kansas, Massachusetts, Mississippi, Nebraska, New York, North Carolina, South Carolina, South Dakota, Wisconsin.
TYPE LOCALITY: Society Hill, South Carolina, on *Poa megastachya* (*Eragrostis major*).
DISTRIBUTION: Connecticut to Mississippi and South Dakota; also in South America and Europe.
ILLUSTRATIONS: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 52;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*11*).
EXSICCATI: Ellis, N. Am. Fungi *1098;* Rab.-Wint. Fungi Eur. *3402;* Griff. West Am. Fungi *207, 208;* Seym. & Earle, Econ. Fungi *C 87*; Ellis, Ev. & Barth. Fungi Columb. *2195.*

29. **Ustilago Bouteloues** Kellerm. & Swingle, Jour. Myc. **5**: 13. 1889.

Sori in the ovaries, 2–4 mm. in length, more or less concealed by the glumes but at maturity becoming evident on rupture of the covering membrane by the dusty olive-brown spore-mass; spores reddish-brown, chiefly ovoid to spherical, conspicuously echinulate, 8–13 μ in length.

ON POACEAE:
Bouteloua oligostachya, Kansas, Oklahoma, Nebraska.
TYPE LOCALITY: Manhattan, Kansas, on *Bouteloua oligostachya.*
DISTRIBUTION: Nebraska to Oklahoma.
ILLUSTRATIONS: Jour. Myc. 5: *pl. 1, f. 26–40;* Trans. Acad. Sci. St. Louis **7**: *pl. 29, f. 11.*
EXSICCATI: Ellis, Ev. & Barth. Fungi Columb. *2192*

30. **Ustilago Tricuspidis** Ellis & Gall.; Clinton, Jour. Myc. **8**: 135. 1902.

Sori in ovaries, ellipsoidal, about 4 mm. in length, infecting an occasional spikelet and showing between the spreading glumes; spores medium reddish-brown, ovoid to chiefly subspherical or spherical, rather prominently verruculo-echinulate, chiefly 8–11 μ in length.

ON POACEAE:
Tridens seslerioides (*Tricuspis seslerioides*), Missouri, West Virginia.
TYPE LOCALITY: Charleston, Missouri, on *Triodea cuprea* (*Tridens seslerioides*).
DISTRIBUTION: West Virginia and Missouri.

31. **Ustilago minor** J. B. S. Norton, Trans. Acad. Sci. St. Louis **7**: 238. 1896.

Sori on the leaves and leaf-sheaths, forming ovoid to linear pustules, 1–5 mm. or even longer, with the covering membrane at maturity becoming ruptured and the dusty black-brown spore-mass scattered; spores light to medium-dark reddish-brown, chiefly ovoid to spherical, minutely echinulate, mostly 7–9 μ in length.

ON POACEAE:
Bouteloua hirsuta, Kansas.
TYPE LOCALITY: Manhattan, Kansas, on *Bouteloua hirsuta.*
DISTRIBUTION: Kansas.
ILLUSTRATION: Trans. Acad. Sci. St. Louis **7**: *pl. 28, f. 3, pl. 29, f. 5, 12.*

32. **Ustilago Hieronymi** Schröt.; P. Henn. Hedwigia **35**: 213. 1 Au 1896.

Ustilago filifera J. B. S. Norton, Trans. Acad. Sci. St. Louis **7**: 237. 9 N 1896. (Type from Kansas, on *Bouteloua racemosa.*)

Sori in the leaves and leaf-sheaths, usually forming oblong sausage-shaped pustules, chiefly 1–5 mm. or apparently by terminal coalescence more elongate, at first firmly agglutinated but eventually with the thin membrane rupturing and the dusty black spore-mass becoming scattered; spores dark reddish-brown, more or less irregularly polyhedral, occasionally oblong or ovoid, to subspherical, rather obscurely echinulate, 11–16 μ, in some specimens the most elongate rarely 20 μ, in length.

ON POACEAE:
Atheropogon curtipendulus (*Bouteloua racemosa*), Arizona, Kansas, Texas, Utah.
Bouteloua breviseta, New Mexico.
Bouteloua bromoides, Arizona.
Bouteloua eriopoda, Arizona.
Bouteloua Havardii, Arizona.

Bouteloua oligostachya, Arizona, Colorado, Kansas, Montana, New Mexico.
Bouteloua polystachya, Arizona.
Dasyochloa pulchella (*Triodia pulchella*), Arizona.
Pappophorum Wrightii, Arizona.
Triathera aristidoides (*Bouteloua aristidoides*), Arizona, Mexico.

TYPE LOCALITY: Argentina, on *Bouteloua ciliata*.
DISTRIBUTION: Montana to Texas, Arizona and Mexico; also in South America.
ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 28, f. 1–2, 4–6, pl. 29, f. 1–4, 9, 10.*
EXSICCATI: Griff. West Am. Fungi *217, 217a, 218, 219, 220, 224, 227.*

33. **Ustilago Buchloes** Ellis & Tracy, Jour. Myc. **6**: 77. 1890.

Sori on leaves, usually forming sausage-shaped pustules, ovoid to linear, 3–10 mm. in length, at first covered by thin grayish membrane which soon ruptures and black-brown spore-mass becomes scattered; spores dark reddish-brown, ellipsoidal to spherical or occasionally somewhat angled, smooth or very obscurely verruculose, 13–16 μ in length.

ON POACEAE:
Bulbilis dactyloides (*Buchloe dactyloides*), Nebraska, New Mexico.
TYPE LOCALITY: Coolidge, New Mexico, on *Buchloe dactyloides* (*Bulbilis dactyloides*).
DISTRIBUTION: Nebraska and New Mexico.
ILLUSTRATION: Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*8*).

34. **Ustilago pustulata** Tracy & Earle, Bull. Torrey Club **22**: 175. 1895.

Sori usually in ovaries, sometimes also in stamens, forming ovate bodies about 2–4 mm. in length, occasionally on stem near nodes or at base of inflorescence and then forming more conspicuous often nodular swellings one to several centimeters in length, with dehiscence of the thin smooth membrane disclosing a dusty olive-brown spore-mass; spores chiefly ovoid to spherical, occasionally more irregular, usually prominently echinulate, 9–12 μ, the most elongate rarely 15 μ, in length.

ON POACEAE:
Panicum proliferum, Illinois, Iowa, Kansas, Mississippi, Nebraska.
Panicum virgatum, Texas.
TYPE LOCALITY: Starkville, Mississippi, on *Panicum proliferum*.
DISTRIBUTION: Illinois to Nebraska, Mississippi and Texas.
ILLUSTRATION: Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*2*).
EXSICCATI: Ellis & Ev. N. Am. Fungi *3339*; Seym. & Earle, Econ. Fungi *C 84*; Ellis, Ev. & Barth. Fungi Columb. *2194*.

35. **Ustilago sphaerogena** Burrill; (Ellis & Ev. N. Am. Fungi *1892*; hyponym. 1887) Sacc. Syll. Fung. **7**[2]: 468. 1888.

Cintractia sphaerogena Hume, Proc. Iowa Acad. Sci. **9**: 233. 1902.

Sori in ovaries, ovate, chiefly 3–6, rarely 10, mm. in length, covered with a tough hispid membrane which ruptures irregularly from apex disclosing at first an agglutinated but finally a dusty olive-brown spore-mass; spores ovoid to subspherical, prominently and sharply echinulate, chiefly 9–12 μ in length.

ON POACEAE:
Echinochloa colona (*Panicum colonum*), Texas.
Echinochloa Crus-galli (*Panicum Crus-galli*), Connecticut, Illinois, Iowa, Missouri, Nebraska, North Carolina; Mexico.
Echinochloa Walteri (*Panicum Walteri*), Delaware.
TYPE LOCALITY: Osborne, Illinois, on *Panicum Crus-galli* (*Echinochloa Crus-galli*).
DISTRIBUTION: Connecticut to Nebraska, North Carolina, and Mexico.
ILLUSTRATIONS: Bot. Gaz. **19**: *pl. 18, f. 5–7*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 53*; Bull. Iowa Agr. Exp. Sta. 54: *f. 120* (*7*).
EXSICCATI: Ellis & Ev. N. Am. Fungi *1892*; Seym. & Earle, Econ. Fungi *C 88, C 147*; Rab.-Wint.-Paz. Fungi Eur. *4307*.

There is some question whether this species is distinct from *Ustilago trichophora* (Link) J. Kunze reported by Körnicke on *Panicum colonum* from Egypt. The same host has been found in this country with a smut, and a recent examination of the specimens shows it to be the same as *Ustilago sphaerogena*, except the sori are somewhat smaller.

36. **Ustilago Crus-galli** Tracy & Earle, Bull. Torrey Club **22**: 175. 1895.

Cintractia Seymouriana Magn. Ber. Deuts. Bot. Ges. **14**: 217. 1896. (Type from Wellesley, Massachusetts, on *Panicum Crus-galli*.)
Cintractia Crus-galli Magn. Ber. Deuts. Bot. Ges. **14**: 392. 1896.

Sori often encircling stem at nodes or at the place of the inflorescence infecting both stem and leaves, prominent, often nodular, one to several centimeters in length, protected by

tough hispid membrane which upon rupture discloses an olive-brown dusty spore-mass; spores ovoid to spherical, occasionally more elongate, rather bluntly echinulate or even verruculose, chiefly 10–14 μ in length.

ON POACEAE:
Echinochloa Crus-galli (*Panicum Crus-galli*), Arkansas, Colorado, Connecticut, Illinois, Massachusetts, Minnesota, Oregon, South Dakota, Utah, Washington.
Echinochloa Walteri (*Panicum Walteri*), Delaware.
TYPE LOCALITY: Salt Lake City, Utah, on *Panicum Crus-galli* (*Echinochloa Crus-galli*).
DISTRIBUTION: New England to Delaware, Utah and Washington.
ILLUSTRATIONS: Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (6)*; Ber. Deuts. Bot. Ges. **14**: *pl. 15, f. 1–14.*
EXSICCATI: Sydow, Ust. *125, 179*; Vest. Micr. Rar. Sel. *324*; Griff. West Am. Fungi *212, 212a*; Seym. & Earle, Econ. Fungi *C 67.*

37. **Ustilago heterogena** P. Henn. Hedwigia **43**: 155. 1904.

Sori on various parts of host, most frequently at nodes of the stem, involving the axial growths and transforming them entirely or their base into a conspicuous tumor, ovate to elongate-lanceolate, often 40 by 15 mm., covered by the thick, smooth envelope of plant tissues, finally rupturing and disclosing a brown-black semi-agglutinated to dusty spore-mass; spores medium to dark reddish-brown, chiefly ovoid to spherical, conspicuously echinulate, 10–14 μ, rarely 16 μ, in length.

ON POACEAE:
Leptochloa scabra Louisiana.
TYPE LOCALITY: Brazil, on *Leptochloa virgata*.
DISTRIBUTION: Louisiana; also in South America.

38. **Ustilago Zeae** (Beckm.) Unger, Einfl. Bodens 211. 1836.

Lycoperdon Zeae Beckm. Hannov. Mag. **6**: 1330. 1768.
Uredo Zeae Schw. Schr. Nat. Ges. Leipzig **1**: 71. 1822.
Ustilago Maydis Corda, Ic. Fung. **5**: 3. 1842.
Ustilago Schweinitzii Tul. Ann. Sci. Nat. III. **7**: 86. 1847.
Ustilago Zeae-Mays Wint.; Rab. Krypt. Fl. 1[1]: 97. 1881.
Ustilago Euchlaenae Arcang. Erb. Critt. Ital. II. *1152*. 1882. (Type from Italy, on cult. *Euchlaena luxurians.*)
Ustilago Mays-Zeae Magn. Deuts. Bot. Monats. **13**: 50. 1895.

Sori on any part of the host, usually prominent, forming irregular swellings from a few mm. to over a dm. in diameter, at first protected by a sort of false white membrane composed of plant cells and semi-gelatinized fungous threads, soon rupturing and disclosing a reddish-brown spore-mass; spores ellipsoidal to spherical or rarely more irregular, prominently though rather bluntly echinulate, 8–11 μ, the most elongate 15 μ, in length.

ON POACEAE:
Euchlaena luxurians, Alabama, Connecticut, Illinois, Iowa, Kansas, Wisconsin.
Zea Mays, Alabama, California, Connecticut, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Texas, Vermont, West Virginia, Wisconsin, Utah; Ontario; Mexico; Cuba; Porto Rico.
TYPE LOCALITY: France, on *Zea Mays*.
DISTRIBUTION: Coextensive with the cultivation of maize.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 2, f. 1–17*; Jour. Myc. **5**: *pl. 2–7*; Ann. Rep. Conn. Agr. Exp. Sta. **1889**: *pl. 2, f. 15*; Trans. Acad. Sci. St. Louis **7**: *pl. 25, f. 6–13*; Ann. Rep. Ind. Agr. Exp. Sta. **12**: *pl. 10–13*; Bull. Ill. Agr. Exp. Sta. 57: *pl. G, H, I, J, K, R 3, T 1–3*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 2, 55*; Bull. Kan. Agr. Exp. Sta. 62: *pl. 1–3, 5, 7*; Brefeld, Unters. Gesammt. Myk. **5**: *pl. 4, f. 1–16*, **11**: *pl. 2–5*; Ber. Deuts. Bot. Ges. **20**: *pl. 11*; Bull. Soc. Myc. Fr. **14**: *pl. 12*; Tubeuf, Diseases Pl. *f. 148–152.*
EXSICCATI: Rav. Fungi Car. IV. *100*; Rav. Fungi Am. *281*; Underw. & Cook, Illustr. Fungi *55*; Seym. & Earle, Econ. Fungi *71 a–b, C 97, C 98, C 99, C 100*; Shear, N. Y. Fungi *135*; Sydow, Ust. *157*; Griff. West Am. Fungi *99*; Kellerm. Ohio Fungi *16*; Kellerm. & Swingle, Kan. Fungi *25.*

39. **Ustilago Kellermanii** Clinton, sp. nov.

Sori involving terminal and nodal growths (aborting the inflorescence), converting them into very elongate outbreaks, enwrapped by the leaf-sheaths but with the internal tissues shredded and mixed with the dusty brown-black spore-mass; spores dark reddish-brown, ovoid to spherical, occasionally more elongate or irregular, prominently and coarsely verruculose, chiefly 10–14 μ in length.

ON POACEAE:
? *Euchlaena luxurians*, Guatemala.
Type collected near Guatemala City, March, 1906, by W. A. Kellerman (*no. 5078*), in a field cultivated for fodder, apparently of teosinte. The elongate shredded outbreaks and the somewhat larger, darker-colored and coarsely verruculose spores distinguish this species from *Ustilago Zeae*.

40. **Ustilago neglecta** Niessl; Rab. Fungi Eur. *1200*. 1868.

Erysibe Panicorum Panici-glauci Wallr. Fl. Crypt. Germ. **2**: 216. 1833.
Ustilago Panici-glauci Wint.; Rab. Krypt. Fl. 1[1]: 97. 1881.

Sori in spikelets, infecting all of the spike, ovate, 2–3 mm. in length, enclosed by glumes, soon rupturing and disclosing a dusty dark-brown spore-mass; spores dark-brown, usually ovoid to spherical or sometimes more elongate, prominently and abundantly echinulate, chiefly 10–14 μ in length.

ON POACEAE:
Chaetochloa glauca (*Setaria glauca*), Connecticut, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Minnesota, Nebraska, New Hampshire, New Jersey, New York, Ohio, South Dakota, Vermont, Wisconsin.
TYPE LOCALITY: Gratz, Austria, on *Setaria glauca* (*Chaetochloa glauca*).
DISTRIBUTION: New England and New Jersey to South Dakota and Kansas; also in South America and Europe.
ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 28, f. 7–8;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 49;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*7*).
EXSICCATI: Ellis, N. Am. Fungi *286;* Seym. & Earle, Econ. Fungi, *65 a–b, 65 c, C 81;* Barth. Ellis & Ev. Fungi Columb. *1700;* Griff. West Am. Fungi *13*.

41. **Ustilago Uniolae** Ellis & Ev. Jour. Myc. **3**: 56. 1887.

Sori in ovaries, showing between the glumes as slightly swollen ovoid bodies, about 2–4 mm. in length, rather firm, with a semi-agglutinated or finally dusty spore-mass; spores dark reddish-brown, oblong or ovate to spherical or occasionally angled and irregular, obscurely and minutely verruculose, 9–13 μ in length.

ON POACEAE:
Uniola laxa (*U. gracilis*), Delaware, Georgia, Mississippi, Texas.
TYPE LOCALITY: Texas, on *Uniola gracilis* (*U. laxa*).
DISTRIBUTION: Delaware to Texas.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 93, C 149*.

42. **Ustilago Eriocauli** (Massee) Clinton, Jour. Myc. **8**: 137. 1902.

Cintractia Eriocauli Massee, Grevillea **22**: 67. 1894.
Ustilago Eriocauli Clinton, Rhodora **3**: 82. 1901. (Type from Massachusetts, on *Eriocaulon septangulare*.)

Sori in ovaries, inconspicuous, hidden by floral envelopes, black, ovoid, distinctly two-lobed, usually 0.75 mm. long by 1 mm. wide, firm, with a tightly packed dark-olive spore-mass; spores polyhedral to subspherical or occasionally more elongate, rather prominently verruculose, 9–15 μ in length.

ON ERIOCAULACEAE:
Eriocaulon septangulare Connecticut, Massachusetts, New Hampshire.
TYPE LOCALITY: Madagascar, on *Eriocaulon fenestratum*.
DISTRIBUTION: New England; also in Madagascar.
ILLUSTRATION: Rhodora **3**: 81, *f. 2*.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 68*.

43. **Ustilago ornata** Tracy & Earle, Bull. Torrey Club **22**: 175. 1895.

Sori in ovaries, rather inconspicuous, showing between the glumes as ovoid bodies 1–2 mm. in length; spores brown, chiefly subspherical or spherical, occasionally ovate or ovoid, very conspicuously verrucose or echinulate, 10–14 μ in length.

ON POACEAE:
Leptochloa mucronata, Mississippi.
TYPE LOCALITY: Starkville, Mississippi, on *Leptochloa mucronata*.
DISTRIBUTION: Known only from the type locality.
EXSICCATI: Ellis & Ev. N. Am. Fungi *3340;* Seym. & Earle, Econ. Fungi *542*.

44. **Ustilago Sporoboli** Tracy & Earle, Bull. Torrey Club **23**: 211. 1896.

Sori in ovaries, ovate, about 2 mm. in length, forming rather firm compact spore-masses; spores medium-dark reddish-brown, ovoid to spherical with prominent coarse subhyaline tubercles, 11–15 μ in length.

ON POACEAE:
Sporobolus ejuncidus (*S. junceus*), Mississippi.
TYPE LOCALITY: Columbus, Mississippi, on *Sporobolus junceus* (*S. ejuncidus*).
DISTRIBUTION: Known only from the type locality.

45. **Ustilago Vilfae** Wint. Bull. Torrey Club **10**: 7. 1883.

Tilletia subfusca Hume, Proc. Iowa Acad. Sci. **9**: 235. 1902. (Type from Iowa, on *Sporobolus neglectus*.)

Sori in the inflorescence, converting it into an elongate dusty spore-mass 1–2 cm. in length, at first completely hidden by the enveloping leaf-sheath; spores dark reddish-brown, ovoid or rarely oblong to spherical, often slightly angled, more or less prominently verruculose, chiefly 12–16 μ, rarely 19 μ, in length.

ON POACEAE:
Sporobolus neglectus, Iowa, Nebraska.
Sporobolus vaginaeflorus, Kansas, Nebraska, Pennsylvania.
TYPE LOCALITY: Chester County, Pennsylvania, on *Vilfa vaginaeflora* (*Sporobolus vaginaeflorus*).
DISTRIBUTION: Pennsylvania; Iowa to Nebraska.
EXSICCATI: Ellis, N. Am. Fungi *1093*; Ellis, Ev. & Barth. Fungi Columb. *2197*.

46. **Ustilago Rabenhorstiana** Kühn, Hedwigia **15**: 4. 1876.

Caeoma Syntherismae Schw. Trans. Am. Phil. Soc. II. **4**: 290. 1832. (Type from North Carolina, on *Syntherisma* sp.)
Ustilago Cesatii Fisch. de Waldh. Aperçu Syst. Ust. 25, *p.p.* 1877.
Ustilago Syntherismae Cooke, Grevillea **6**: 138. 1878. Not *U. Syntherismae* Peck. 1875.

Sori usually involving the entire inflorescence, linear-oblong, 3–5 cm. in length, at first hidden by enveloping leaf-sheaths but finally more or less visible as a black-brown dusty mass of spores surrounding the elongate remnants of the inflorescence; spores reddish olive-brown, ovoid to spherical or occasionally somewhat angled, echinulate or verruculose, usually 10–14 μ in length.

ON POACEAE:
Syntherisma filiforme (*Panicum filiforme*), New Jersey; Mexico (Guadalajara).
Syntherisma fimbriatum (*P. fimbriatum*), Mexico (Guadalajara).
Syntherisma humifusum (*P. glabrum*), Iowa, Illinois, Kansas, Minnesota, New Hampshire.
Syntherisma sanguinale (*P. sanguinale*), Alabama, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Texas, Wisconsin.
Syntherisma (*Panicum*) sp., New York, South Carolina.
TYPE LOCALITY: Europe, on *Panicum sanguinale* (*Syntherisma sanguinale*).
DISTRIBUTION: New England to Georgia, Minnesota, and Mexico; also in Europe and Australia.
ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 26, f. 4–5, pl. 27, f. 6–8*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 50*; Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*14*); Ann. Rep. N. J. Agr. Exp. Sta. 1898: 334, *pl. 12*.
EXSICCATI: Ellis, N. Am. Fungi *287, 1890b*; Seym. & Earle, Econ. Fungi *63, 63b, C 85, C 144, C 145*; Rab.-Wint.-Paz. Fungi Eur. *4010*; Sydow, Ust. *164*; Rav. Fungi Am. *56*.

47. **Ustilago Holwayana** P. Henn. Bot. Gaz. **28**: 274. 1899.

Sori in the inflorescence, elongate, 2 cm. or more in length, concealed by leaf-sheaths, at first covered by a thin membrane which soon ruptures disclosing a black-brown dusty spore-mass surrounding remains of inflorescence as a columella; spores medium-dark reddish-brown, ovoid to spherical or occasionally slightly angled, rather prominently echinulate, 12–16 μ in length.

ON POACEAE:
Paspalum velutinum, Mexico.
TYPE LOCALITY: Patzcuaro, Michoacan, Mexico, on *Paspalum velutinum*.
DISTRIBUTION: Mexico.

48. **Ustilago Aegopogonis** P. Henn. Hedwigia **37**: 267. 1898.

Sori elongate-ellipsoidal, 5–10 mm. in length, enclosed in leaf-sheaths, possibly aborting the inflorescence but the dusty black spore-mass without remains of plant tissues; spores dark reddish-brown, subopaque, broadly oblong or ovate to spherical or often slightly angled, rather obscurely verruculo-echinulate, chiefly 11–14 μ in length.

ON POACEAE:
Aegopogon cenchroides, Mexico.
Hilaria cenchroides, Arizona.

TYPE LOCALITY: Near City of Mexico, Mexico, on *Aegopogon cenchroides*.
DISTRIBUTION: Arizona and Mexico.

49. **Ustilago Hilariae** Ellis & Tracy, Jour. Myc. **6**: 77. 1890.

Uredo Hilariae Sacc. Syll. Fung. **9**: 333. 1891.

Sori in the inflorescence and somewhat in the enveloping leaves, usually elongate, 0.5–1.5 cm. in length, covered by a thin whitish membrane through which the dark spore-mass shows, or hidden entirely by unaltered enveloping parts; spores light reddish-brown, usually subspherical or spherical or occasionally ovoid, minutely echinulate, chiefly 13–17 μ in length.

ON POACEAE:
Hilaria Jamesii, Colorado, New Mexico.
Hilaria mutica, Arizona.
TYPE LOCALITY: Albuquerque, New Mexico, on *Hilaria Jamesii*.
DISTRIBUTION: Colorado, New Mexico, and Arizona.

50. **Ustilago Mulfordiana** Ellis & Ev. Bull. Torrey Club **22**: 362. 1895.

Tilletia mixta Massee, Kew Bull. 1899: 145, *p.p.* 1899.
Ustilago Festucae-tenellae P. Henn. Hedwigia Beibl. **41**: 61. 1902. (Type from Mexico, on *Festuca tenella*.)

Sori in the inflorescence (often destroying only basal part) and the enveloping leaves, elongate, usually 1–2 cm. in length, covered by the thin whitish epidermis or by the less altered opaque parts; spores nearly opaque, dark reddish-brown, ovoid to spherical or somewhat irregular, when dry laterally compressed, rather coarsely though obscurely verruculose, chiefly 12–16 μ, occasionally even 18 μ, in length.

ON POACEAE:
Festuca microstachya, Washington.
Festuca octoflora (*F. tenella*), Arizona, Idaho, Montana, Oregon, Utah, Washington, Wyoming; Mexico.
Festuca sp., California, Idaho.
TYPE LOCALITY: Near Boisé City, Idaho, on *Festuca* sp.
DISTRIBUTION: Montana to Washington and Mexico.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1895*; Seym. & Earle, Econ. Fungi *C 76*; Griff. West Am. Fungi *229*, *229a*, *230*.

51. **Ustilago elegans** Griff. Bull. Torrey Club **29**: 292. 1902.

Sori in the inflorescence, hidden by leaves and sheaths, sometimes showing through at the base, with a dusty black-brown spore-mass through which remains of the inflorescence are distributed as slender threads; spores dark reddish-brown, ovoid to chiefly spherical, minutely and rather obscurely verruculose, 10–14 μ in diameter.

ON POACEAE:
Chloris elegans, Arizona.
TYPE LOCALITY: Cochise, Arizona, on *Chloris elegans*.
DISTRIBUTION: Arizona.
ILLUSTRATION: Bull. Torrey Club **29**: 291, *f. 3*.
EXSICCATI: Griff. West Am. Fungi *309*.

52. **Ustilago Dieteliana** P. Henn. Hedwigia **37**: 268. 1898.

Sori very elongate, often 1 or more dm. in length, at apex of culm, enveloped by leaves and leaf-sheaths, apparently infecting inner leaves as well as inflorescence and changing these into elongate shredded filaments scattered among the at first agglutinated but finally dusty olive-black spore-mass; spores dark reddish-brown, chiefly ovoid or ovate to spherical, rather prominently verruculose, 9–14 μ in length.

ON POACEAE:
Tripsacum dactyloides, Mexico.
TYPE LOCALITY: Near City of Mexico, Mexico, on *Tripsacum dactyloides*.
DISTRIBUTION: Mexico.
EXSICCATI: Sydow, Ust. *152*.

53. **Ustilago striaeformis** (Westend.) Niessl, Hedwigia **15**: 1. 1876.

Uredo striaeformis Westend. Bull. Acad. Roy. Belg. **18**^{2}: 406. 1851.
Tilletia Debaryana Fisch. de Waldh.; Rab. Fungi Eur. *1097*. 1866. (Type from Europe, on *Holcus mollis*.)
Tilletia striaeformis Oud. Bot. Zeit. **36**: 441. 1878.

Ustilago washingtoniana Ellis & Ev. Bull. Torrey Club **22**: 57. 1895. (Type from Washington, on unknown grass.)

Sori in leaves, rarely in the inflorescence, from short-linear often extending apparently by terminal fusion for several cm., also occasionally fusing laterally to cover most of leaf, at first covered by epidermis but this soon ruptured and dusty brown-black lines of spores becoming scattered and leaves shredded; spores usually ellipsoidal to spherical, occasionally irregular, prominently echinulate, chiefly 9–14 μ in length.

ON POACEAE:
Agrostis alba vulgaris, Connecticut, Illinois, Iowa, Missouri.
Ammophila arenaria (*A. arundinacea*), Connecticut, Maine, Massachusetts.
Elymus canadensis glaucifolius, Wisconsin.
Elymus robustus, Utah.
Elymus virginicus, Illinois.
Festuca nutans, District of Columbia.
Phleum pratense, California, Illinois, Indiana, Iowa, Kansas, Massachusetts, Minnesota, Missouri, New Jersey, New York, Ohio, Utah, Wisconsin; Canada.
Poa annua, Massachusetts.
Poa debilis, Wisconsin.
Poa pratensis, Delaware, Illinois, Iowa, Ohio, Washington.
Sitanion longifolium, California.
Unknown grass, Massachusetts, New Jersey, New York, Texas, Washington.
TYPE LOCALITY: Courtrai, Belgium, on *Holcus lanatus*.
DISTRIBUTION: New England to Texas, California and Washington; Canada; also in Europe.
ILLUSTRATIONS: Bull. Ill. Agr. Exp. Sta. 57: *pl. Q, R 4, S 6–7*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 51*; Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (2)*; *122*; Jahrb. Wiss. Bot. **7**: *pl. 7, f. 2–4, pl. 9, f. 14–16*.
EXSICCATI: Seym. & Earle, Econ. Fungi *76, 77, C 89, C 90, C 91, C 148*; Ellis & Ev. Fungi Columb. *1370*; Ellis, N. Am. Fungi *1498*; Underw. & Cook, Illust. Fungi *58*.

54. **Ustilago Calamagrostidis** (Fuckel) Clinton, Jour. Myc. **8**: 138. 1902.

Tilletia Calamagrostis Fuckel, Symb. Myc. 40. 1869.

Sori in leaves, more rarely also in axis of inflorescence and even in spikelets, generally showing as linear striae, distinct or often more or less confluent, at first covered by epidermis, upon rupture disclosing dusty brown-black lines of spores; spores medium to dark reddish-brown, rather irregularly oblong to spherical, usually angular, prominently verrucose, 13–20 μ in length.

ON POACEAE:
Calamagrostis breviseta (*C. Pickeringii*), New York.
Calamagrostis canadensis, Vermont.
Calamagrostis canadensis acuminata, Wyoming.
TYPE LOCALITY: Europe, on *Calamagrostis epigeios*.
DISTRIBUTION: Vermont, New York and Wyoming; also in Europe.
EXSICCATI: Griff. West Am. Fungi *228*.

55. **Ustilago macrospora** Desmaz. Pl. Crypt. II. *1727*. 1850.

Tilletia serpens Karst. Fung. Fenn. *599*. 1866.
Tilletia aculeata Ule, Abh. Bot. Ver. Prov. Brand. **25**: 213. 1884. (Type from Berlin, Germany, on *Agropyron repens*.)

Sori in leaves and glumes, generally showing as linear striae, but often more or less merged, at first covered by epidermis, but this rupturing and disclosing black-brown dusty lines of spores; spores medium to dark reddish-brown, chiefly ovoid to spherical or occasionally somewhat irregular and more elongate, coarsely verrucose, at circumference usually showing the projections as tinted blunt scale-like appendages, sometimes even semi-reticulate, 12–19 μ in length.

ON POACEAE:
Agropyron repens, Iowa, Massachusetts, Wisconsin.
Agropyron spicatum, Oregon.
Agropyron spicatum inerme, Washington.
Agropyron sp., Utah.
Elymus sp., Utah.
TYPE LOCALITY: France, on *Bromus pinnatus*.
DISTRIBUTION: Massachusetts to Washington and Utah; also in Europe.
EXSICCATI: Ellis, Ev. & Barth. Fungi Columb. *1900*; Seym. & Earle, Econ. Fungi *C 141*.

56. **Ustilago echinata** Schröt. Abh. Schles. Ges. Abth. Nat. Med. 1869–72 : 4. 1870.

Ustilago verrucosa Vesterg. Jahreskat. Wiener Krypt. Tausch. 3. 1897. (Type from Sweden, on *Baldingera arundinacea*.) Not *U. verrucosa* Schröt. 1896.
Ustilago Vestergreni Sacc. & Sydow ; Sacc. Syll. Fung. **14** : 413. 1899.

Sori in leaf-blades and sheaths, forming conspicuous elongate striae often running greater length of leaf, upon rupture forming dusty or semi-agglutinated brown-black spore-lines ; spores rather dark reddish-brown, ovoid to spherical, provided with conspicuous irregular scale-like tubercles which are rarely semi-anastomotic, chiefly 14–17 μ, the most elongate rarely 19 μ, in length.

ON POACEAE :
Phalaris arundinacea, Nebraska, Washington.
TYPE LOCALITY : Silesia, Europe, on *Phalaris arundinacea*.
DISTRIBUTION : Nebraska and Washington ; also in Europe.

57. **Ustilago Arthurii** Hume, Proc. Iowa Acad. Sci. **9** : 233. 1902.

Ustilago Scolochloae Griff. Bull. Torrey Club **31** : 86. 1904. (Type from Oregon, on *Scolochloa festucacea*.)

Sori in the enfolded leaves, forming linear striae chiefly on their inner surface, which soon become obliterated by the dusty reddish-brown stratum of spores filling the interior ; spores olive-brown, rather regular, chiefly subspherical or spherical, abundantly covered with conspicuous tubercles or scales, rarely very slightly anastomosing, 12.5–16 μ in length.

ON POACEAE :
Panicularia americana (*Glyceria grandis*), Iowa.
Scolochloa festucacea, Oregon.
TYPE LOCALITY : Spirit Lake, Iowa, on *Panicularia americana*.
DISTRIBUTION : Iowa and Oregon.
ILLUSTRATION : Bull. Torrey Club **31** : 85, *f. 4*.
EXSICCATI : Seym. & Earle, Econ. Fungi *C 135*.

58. **Ustilago Heufleri** Fuckel, Symb. Myc. 39. 1869.

Ustilago Erythronii G. W. Clinton ; Peck, Bull. Buffalo Soc. Nat. Sci. **1** : 67. 1873. (Type from New York, on *Erythronium americanum*.)
Ustilago Tulipae Wint. in Rab. Krypt. Fl. 1^1 : 86. 1881.
Ustilago Ornithogali f. *Erythronii* De-Toni ; Sacc. Syll. Fung. 7^2 : 452. 1888.

Sori in leaves, forming conspicuous rounded or often elongate pustules, covered by a thin whitish membrane which upon rupture discloses a somewhat dusty black spore-mass ; spores dark reddish-brown, ovoid or ovate to spherical, usually regular, thick-walled, smooth but inner wall provided with more or less evident projections extending into outer lighter-colored part, 13–22 μ in length.

ON LILIACEAE :
Erythronium americanum, Missouri, New Jersey, New York, Pennsylvania.
TYPE LOCALITY : Vienna, Austria, on *Tulipa sylvestris*.
DISTRIBUTION : New York to Missouri ; also in Europe.
ILLUSTRATION : Bull. Soc. Nat. Mosc. 40^1 : *pl. 3, f. 29*.
EXSICCATI : Shear, N. Y. Fungi *83* ; Ellis, N. Am. Fungi *1095* ; Ellis & Ev. Fungi Columb. *471* ; Rab. Fungi Eur. *4207*.

59. **Ustilago Vaillantii** Tul. Ann. Sci. Nat. III. **7** : 90. 1847.

Sori in anthers and other essential organs, filling the floral envelopes with a dusty dark-olive mass ; spores variable, golden-brown, ellipsoidal to spherical, smooth, but inner wall apparently obscurely echinulate, chiefly 7–12 μ in length.

ON LILIACEAE :
Scilla praecox (cult.), Massachusetts.
TYPE LOCALITY : Europe, on *Muscari comosum*.
DISTRIBUTION : Massachusetts ; also in Europe.
ILLUSTRATIONS : Ann. Sci. Nat. III. **7** : *pl. 3, f. 15–19* ; Brefeld, Unters. Gesammt. Myk. **12** : *pl. 6, f. 32–38* ; Bull. Soc. Nat. Mosc. 40^1 : *pl. 3, f. 10* ; Schröt. Beitr. Biol. Pfl. **2** : *pl. 12, f. 4*.

60. **Ustilago Oxalidis** Ellis & Tracy, Jour. Myc. **6** : 77. 1890.

Sori in the seeds, inconspicuous (affected ovaries scarcely differing from the normal except on dehiscence showing more or less of the seeds changed into reddish-brown dusty

spore-masses slightly larger than the uninfected seeds); spores golden-yellow, chiefly ovoid to spherical, occasionally more elongate or irregular, coarsely verrucose, 13–20 μ in length; conidia produced in anthers, inconspicuous, ovoid to subspherical, hyaline, thin-walled.

ON OXALIDACEAE:
Oxalis stricta, Connecticut, Illinois, Iowa, Kansas, Mississippi, Missouri, New York, Wisconsin.
TYPE LOCALITY: Starkville, Mississippi, on *Oxalis stricta*.
DISTRIBUTION: Connecticut to Wisconsin, Kansas and Mississippi; also in South America.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 3, 48.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *2424;* Ellis & Ev. Fungi Columb. *470;* Rab.-Wint.-Paz. Fungi Eur. *4007;* Seym. & Earle, Econ. Fungi *C 79, C 80.*

61. **Ustilago vinosa** (Berk.) Tul. Ann. Sci. Nat. III. **7**: 96. 1847.

Uredo vinosa Berk.; Tul. *loc. cit.*, as synonym.

Sori in the essential organs, forming purplish dusty spore-masses usually enwrapped as a somewhat swollen body by the perianth; spores very pale-violet, ovoid to spherical or occasionally slightly irregular, thick-walled, ridged with very small reticulations (1 μ or less in diameter), chiefly 7–10 μ in length.

ON POLYGONACEAE:
Oxyria digyna, California, Washington; Alaska; Greenland.
Oxyria sp., Wyoming.
TYPE LOCALITY: Scotland, on *Oxyria reniformis*.
DISTRIBUTION: Greenland, Wyoming, California, Washington and Alaska; also in Europe.
ILLUSTRATION: Brefeld, Unters. Gesammt. Myk. **12**: *pl. 8, f. 13–15.*

62. **Ustilago violacea** (Pers.) Fuckel, Jahrb. Ver. Nat. Nass. **15**: 21. 1861.

Uredo violacea Pers. Tent. Disp. Fung. 57. 1797.
Ustilago antherarum Fries, Syst. Myc. **3**: 518. 1832.

Sori inconspicuous, filling swollen anthers, soon rupturing and disclosing violet-colored dusty mass of spores; spores pale-lilac to almost hyaline, ovoid to spherical, occasionally somewhat irregular, with rather conspicuous spore-wall covered with numerous minute reticulations (1 μ or less in diameter), chiefly 5.5–8.5 μ in length.

ON CARYOPHYLLACEAE:
Alsine borealis (*Stellaria borealis*), Greenland.
Arenaria groenlandica, Maine, New Hampshire, New York, Vermont.
Cerastium maximum, Alaska.
Lychnis sp., Minnesota.
Moehringia lateriflora (*Arenaria lateriflora*), Minnesota, Wisconsin.
Moehringia lateriflora glabrescens (*Arenaria lateriflora glabrescens*), Washington.
Silene acaulis, New Hampshire.
Silene Lyallii (*S. Douglasii Macounii*), Montana.
Silene multicaulis, Washington.
Silene tetonensis, Wyoming.
Silene Watsoni, California, Washington.
TYPE LOCALITY: Europe, on *Silene nutans*.
DISTRIBUTION: New England to California, Alaska, and Greenland; also in South America, Europe, Asia and Africa.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 4, f. 12–19, pl. 5, f. 23;* Brefeld, Unters. Gesammt. Myk. **5**: *pl. 1;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 17;* Jahrb. Wiss. Bot. **7**: *pl. 12, f. 1–26;* Trans. Wisc. Acad. **12**: *pl. 8–9, f. 8–22.*

Ustilago violacea major Clinton, Jour. Myc. 8: 139. 1902. Spores deeper violet and chiefly 7–12 μ in length. ON CARYOPHYLLACEAE: *Silene Watsoni*, Mt. Rainier, Washington.

63. **Ustilago Gayophyti** Hark. Bull. Calif. Acad. Sci. **1**: 36. 1884.

Sori in seeds, upon dehiscence of ovary showing as small somewhat dusty purple-black masses; spores rather dark-purple, ovoid or ovate to spherical, provided with small reticulations (about 1 μ in depth and width), chiefly 12–18 μ in length.

ON ONAGRACEAE:
Gayophytum caesium, Utah.
Gayophytum lasiospermum, Oregon.
Gayophytum ramosissimum, California, Oregon, Utah.
TYPE LOCALITY: Summit, Placer County, California, on *Gayophytum ramosissimum*.
DISTRIBUTION: Utah, California and Oregon.

64. **Ustilago Calandriniae** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 378. 1904.

Sori in the flowers, enclosed by the floral envelopes, about 3 or 4 mm. in diameter, forming a purplish-black dusty spore-mass; spores dark reddish-purple, ovoid to subspherical or spherical, regularly and rather minutely reticulately winged (with reticulations about 1.5–2 μ wide and 1–2 μ high), 13.5–17 μ in length.

ON PORTULACACEAE:
Calandrinia Breweri, California.
Calandrinia Menziesii, California,
TYPE LOCALITY: Santa Barbara, California, on *Calandrinia Breweri*.
DISTRIBUTION: California.

65. **Ustilago anomala** J. Kunze (Fungi Sel. Exs. *23;* hyponym. 1877); Wint. in Rab. Krypt. Fl. **1**[1]: 100. 1881.

Ustilago pallida Schröt.; Fisch. de Waldh. Aperçu Syst. Ust. 30. My 1877. (Type from Germany, on *Polygonum Convolvulus*.) Not *U. pallida* Körn. Mr 1877.

Sori in ovaries or essential organs, the infected parts often remaining distinct, 2–3 mm. in length, protected by the perianth, forming a dusty purplish spore-mass; spores light-violet, chiefly ovoid to spherical or occasionally somewhat irregular, with rather fine reticulations (chiefly 1–3 μ wide by 1 μ deep), 10–15 μ, rarely 17 μ, in length.

ON POLYGONACEAE:
Tiniaria cilinodis (*Polygonum cilinode*), Maine, New Hampshire, New York, Vermont.
Tiniaria Convolvulus (*Polygonum Convolvulus*), Illinois.
Tiniaria scandens (*Polygonum scandens*, *P. dumetorum scandens*), Connecticut, Delaware, Indiana, Missouri, Vermont, West Virginia.
TYPE LOCALITY: Saxony, on *Polygonum dumetorum* (*Tiniaria dumetorum*).
DISTRIBUTION: New England to Delaware and Missouri; also in Europe.
ILLUSTRATION: Brefeld, Unters. Gesammt. Myk. **12**: *pl. 8, f. 10–12.*
EXSICCATI: Ellis, N. Am. Fungi *1094;* Seym. & Earle, Econ. Fungi *364, C 63, C 134.*

66. **Ustilago utriculosa** (Nees) Tul. Ann. Sci. Nat. III. **7**: 102. 1847.

Caeoma utriculosum Nees, Syst. Pilze 1: 14. 1817.

Sori in ovaries and probably in stamens, protected by floral envelopes, ovate, about 3–4 mm. in length, forming a dusty purplish spore-mass; spores violet, chiefly subspherical or spherical, with prominent winged reticulations (2–4 μ wide by about 1.5 μ deep), chiefly 9–14 μ in diameter.

ON POLYGONACEAE:
Persicaria amphibia (*Polygonum amphibium*), Indiana, Pennsylvania.
Persicaria Careyi (*Polygonum Careyi*), Maine.
Persicaria Hydropiper (*Polygonum Hydropiper*), Alabama, Connecticut, Iowa.
Persicaria hydropiperoides (*Polygonum hydropiperoides*), Connecticut, Mississippi, Vermont, Wisconsin.
Persicaria incarnata (*Polygonum incarnatum*, *P. lapathifolium incarnatum*), Illinois, Iowa.
Persicaria lapathifolia (*Polygonum lapathifolium*), Connecticut, District of Columbia, Illinois.
Persicaria pennsylvanica (*Polygonum pennsylvanicum*), Alabama, Connecticut, Delaware, Illinois, Iowa, Kansas, Massachusetts, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Rhode Island, Vermont, West Virginia.
Persicaria punctata (*Polygonum punctatum*, *P. acre*), Illinois, Kansas, Mississippi.
Persicaria (*Polygonum*) sp., Illinois, Massachusetts, Michigan, Missouri, New Jersey, North Carolina, Rhode Island, Washington; Mexico.
Polygonum aviculare, California.
Polygonum erectum, Mississippi.
? *Tracaulon sagittatum* (*Polygonum sagittatum*), New York.
TYPE LOCALITY: Europe, on *Polygonum* sp.
DISTRIBUTION: New England to Alabama, Mexico, and Washington; also in South America, Europe, Asia, and Australia.
ILLUSTRATIONS: Nees, *loc. cit. pl. 1, f. 6;* Ann. Sci. Nat. III. **7**: *pl. 4, f. 2–6;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 1, 21, 54;* Brefeld, Unters. Gesammt. Myk. **12**: *pl. 8, f. 42–48;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 19.*
EXSICCATI: Ellis, N. Am. Fungi *288;* Shear, N. Y. Fungi *84;* Seym. & Earle, Econ. Fungi, *376 a–b, C 94, C 95, C 96, C 150;* Rab.-Wint.-Paz. Fungi Eur. *3905;* Ellis & Ev. Fungi Columb. *42, 1798, 2196;* Sydow, Ust. *258.*

67. **Ustilago Rumicis** (Berk.) Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 380. 1904.

Ustilago utriculosa Rumicis Berk. Grevillea **3**: 59. 1874.

Sori in flowers of the inflorescence and involving the floral axes as well, forming purplish dusty spore-masses; spores medium- to rather dark-purple, chiefly ovoid to spherical, with more or less prominently winged reticulations (chiefly 1 μ deep by 1–3 μ wide), mostly 11–16 μ in length.

ON POLYGONACEAE:
Rumex Acetosella, South Carolina.
Rumex hastatulus, Alabama.
TYPE LOCALITY: Santee Canal, South Carolina, on *Rumex Acetosella*.
DISTRIBUTION: South Carolina and Alabama.

68. **Ustilago Parlatorei** Fisch. de Waldh. Hedwigia **15**: 177. 1876.

Sori in stems, petioles and midribs, often extensive and causing more or less distortion and swelling of infected parts, upon rupture of enclosing tissues disclosing dark-violet dusty spore-mass; spores violet, often with reddish tinge, ovoid to chiefly subspherical or spherical though rarely more irregular or elongate, with numerous rather regular reticulations (about 2 μ wide and 1–2 μ deep), chiefly 12–16 μ in length.

ON POLYGONACEAE:
Rumex altissimus, Illinois.
Rumex Britannica, Missouri, Nebraska.
Rumex mexicanus, Mexico.
TYPE LOCALITY: Near Moscow, Russia, on *Rumex maritimus*.
DISTRIBUTION: Illinois, Missouri, Nebraska, and Mexico; also in South America and Europe.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2701;* Rab.-Wint.-Paz. Fungi Eur. *4009;* Sydow, Ust. *112.*

69. **Ustilago Koenigiae** Rostr. Medd. Grønland **3**: 532. 1888.

Sori on stems and sometimes on leaves, forming subspherical to linear pustules, upon rupture disclosing somewhat dusty purplish spore-mass; spores very light-violet, irregular, oblong to spherical, apparently smooth but under an immersion lens showing very minute oblique striae, chiefly 6–9 μ, the most elongate rarely 12 μ, in length.

ON POLYGONACEAE:
Macounastrum islandicum (*Koenigia islandica*), Greenland.
TYPE LOCALITY: Greenland, on *Koenigia islandica* (*Macounastrum islandicum*).
DISTRIBUTION: Known only from the type locality.

70. **Ustilago Piperii** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 382. 1904.

Sori forming pustules on under side of leaves, several mm. in diameter though usually more or less completely confluent, often confined to the margin, upon rupture of thin covering membrane showing dusty dark-purple spore-mass; spores reddish-purple, ovate or ovoid to chiefly subspherical or spherical, occasionally more irregular, minutely and usually obliquely striate, chiefly 7–10 μ, or irregular ones occasionally 12 μ, in length.

ON POLYGONACEAE:
Polygonum Davisiae, California.
Polygonum phytolaccaefolium, Idaho.
TYPE LOCALITY: Bald Mountain, Bitter Root Mountains, Shoshone County, Idaho, on *Polygonum phytolaccaefolium*.
DISTRIBUTION: Idaho and California.

71. **Ustilago punctata** Clinton, sp. nov.

Sori in the inflorescence more or less involving the whole or confined to the individual flowers and enwrapped by the floral envelopes, rarely developing pustules on the floral leaves, forming a black-purple dusty spore-mass; spores dark-purple (immature ones often hyaline or tinted), rather irregular, often adhering together somewhat, ovoid to subspherical or not infrequently flattened and irregularly elongate, appearing smooth but under high powers or an immersion lens usually showing very minutely punctate-reticulate, chiefly 13–17 μ, the most elongate rarely 19 μ, in length.

ON POLYGONACEAE:
Polygonum Newberryi, Washington.
Type collected on *Polygonum Newberryi*, Mt. Paddo, Washington, at an altitude of about 2200 m., by W. N. Suksdorf, September, 1904. Its distinguishing character is the punctate-reticulations of the spores that require very high powers for their detection.

72. **Ustilago Bistortarum** (DC.) Körn. Hedwigia **16**: 38. 1877.

Uredo Bistortarum DC. Fl. Fr. **6**: 76. 1815.
Uredo Bistortarum pustulata DC. Fl. Fr. **6**: 76. 1815.
Uredo Bistortarum marginalis DC. Fl. Fr. **6**: 76. 1815.
Tilletia bullata Fuckel, Symb. Myc. 40. 1869.

Sori in leaves, either in pustules 2–5 mm. in diameter scattered over the surface or in a continuous line closely following the margin, purplish, rupturing usually only on one side of leaf; spores light- to dark-purple, ovoid or ovate to usually chiefly subspherical or spherical, occasionally somewhat angled or irregularly elongate, thick-walled, granular to minutely verruculose, chiefly 13–17 μ, the most elongate rarely 19 μ or even 22 μ, in length.

ON POLYGONACEAE:
Bistorta bistortoides (*Polygonum bistortoides*), Washington.
Bistorta vivipara (*Polygonum viviparum*), Colorado, Wyoming; Alaska; Greenland.
TYPE LOCALITY: Alps and Pyrenees, Europe, on *Polygonum Bistorta* (*Bistorta major*).
DISTRIBUTION: Colorado to Alaska and Greenland; also in Europe.
ILLUSTRATIONS: E. & P. Nat. Pfl. 1^{1**}: 11, *f. 7 E;* Brefeld, Unters. Gesammt. Myk. **12**: *pl. 8, f. 31–34.*
EXSICCATI: Rab.-Wint. Fungi Eur. *3502.*

Ustilago Bistortarum inflorescentiae Trel. Harriman Alaska Exp. Crypt. Bot. 35. 1904. Sori in the flowers, infecting all, enwrapped by floral envelopes, forming a dusty dark-purple spore-mass; spores chiefly dark-purple when mature, rather irregular, ovoid to spherical, often angled or somewhat flattened, often apparently smooth but minutely granular verruculose, chiefly 10–14 μ, the most elongate rarely even 17 μ, in length. ON POLYGONACEAE: *Bistorta vivipara* (*Polygonum viviparum*), Wyoming; Alaska; Greenland. EXSICCATI: Griff. West Am. Fungi *223.*
Rostrup reported this variety from Greenland and Griffiths from Wyoming as *Sphacelotheca Hydropiperis.* It has close resemblance to that species.

DOUBTFUL AND EXCLUDED SPECIES

Sporophaga cyanea (Ces.) Hark. Proc. Calif. Acad. Sci. III. Bot. **1**: 281. 1899. (*Ustilago cyanea* Ces.; Hark. *loc. cit.* as a synonym.) = ? Chytridinales.

Ustilago Arenariae Ellis & Ev. Bull. Torrey Club **22**: 362. 1895. On *Arenaria congesta.* Extraneous spores.

Ustilago Ficuum Reichardt, Verh. Zool.-Bot. Ges. Wien **17**: 335. 1867. On market figs, *Ficus Carica.* = *Sterigmatocystis.*

Ustilago Fischeri Pass. Bull. Agr. Com. Parm. N 1877. On *Zea Mays.* = *Sterigmatocystis.*

Ustilago flavo-nigrescens B. & C. Jour. Linn. Soc. **10**: 358. 1868. On *Scleria* sp. Sclerotium of *Ustilaginoidea.*

Ustilago Gynerii Vize, Grevillea **5**: 110. 1877. On *Gynerium argenteum.* = *Gymnosporium.*

Ustilago Osmundae Peck, Bot. Gaz. **6**: 276. 1881. On *Osmunda regalis.* ? Hyphomycete.

Ustilago Phoenicis Corda, Ic. Fung. **4**: 9. 1840. On market dates, *Phoenix dactylifera.* = *Sterigmatocystis.*

Ustilago strumosa Cooke, Grevillea **9**: 98. 1881. On *Chusquea abietifolia.* Sclerotium of *Ustilaginoidea.*

Ustilago viridis Ellis & Ev. Jour. Myc. **3**: 56. 1887. On *Setaria* sp. Sclerotium of *Ustilaginoidea.*

2. **SPHACELOTHECA** DeBary, Verg. Morph. Biol. Pilze 187. 1884.

Sporisorium Ehrenb.; Link, in Willd. Sp. Pl. 6^2: 86. 1825.
Endothlaspis Sor. Rev. Myc. **12**: 4. 1890.

Sori usually in the inflorescence, often limited to the ovaries, provided with a definite (more or less temporary) false membrane covering a dusty spore-mass and a central columella (usually chiefly of plant tissues); false membrane composed largely or entirely of definite sterile fungous cells which are hyaline or slightly tinted, oblong to spherical, and usually more or less firmly bound together; spores single, usually reddish-brown, de-

veloped in a somewhat centripetal manner as in *Cintractia*, small to medium in size; germination as in *Ustilago*.

Type, *Uredo Hydropiperis* Schum.

Spores olive- or reddish-brown.
- Sori in ovaries. (Often at base of spike in no. 4.)
  - Spores 5–8 μ in length, smooth. — 1. *S. Sorghi.*
  - Spores chiefly 8–12 μ in length.
    - Spores apparently smooth.
      - Sori linear.
        - Host: *Andropogon.* — 2. *S. Seymouriana.*
        - Host: *Sorghastrum* (*Chrysopogon*). — 3. *S. Chrysopogonis.*
      - Sori oblong to ovate. — 4. *S. Nealii.*
    - Spores minutely verruculose.
      - Host: *Heteropogon* (*Andropogon*). — 5. *S. monilifera.*
      - Host: *Echinochloa*, *Syntherisma*, *Panicum.* — 6. *S. diplospora.*
      - Host: *Chaetochloa* (*Setaria*). — 7. *S. pamparum.*
  - Spores chiefly 12–17 μ in length. — 8. *S. occidentalis.*
- Sori involving or aborting the entire inflorescence.
  - Sori linear to oblong.
    - Sori 10–30 mm. in length.
      - Spores 7–10 μ in length. — 9. *S. Ischaemi.*
      - Spores 12–15 μ in length.
        - Host: *Muhlenbergia.* — 13. *S. montaniensis.*
        - Host: *Eragrostis.* — 14. *S. strangulans.*
    - Sori 40–150 mm. in length.
      - Spores 6–8 μ in length. — 11. *S. Panici-leucophaei.*
      - Spores 7–10 μ in length. — 10. *S. Paspali-notati.*
      - Spores 9–13 μ in length. — 12. *S. Andropogonis-hirtifolii.*
  - Sori forming very prominent irregular masses. — 15. *S. Reiliana.*

Spores lilac-tinted to purplish, 8–17 μ in length. — 16. *S. Hydropiperis.*

1. **Sphacelotheca Sorghi** (Link) Clinton, Jour. Myc. 8: 140. 1902.

Sporisorium Sorghi Link, in Willd. Sp. Pl. 6²: 86. 1825.
Tilletia Sorghi-vulgaris Tul. Ann. Sci. Nat. III. 7: 116. 1847.
Ustilago Sorghi Pass.; Thüm. Hedwigia 12: 114. 1873.
Ustilago Tulasnei Kühn, Ber. Sitz. Nat. Ges. Halle 1874: 5. 1874.
Cintractia Sorghi-vulgaris Clinton, Bull. Ill. Agr. Exp. Sta. 47: 404. 1897.

Sori usually in the ovaries or the essential organs, forming oblong to ovate bodies 3–12 mm. in length, rarely fusing the very young spikelets into irregular forms, protected for some time by a false membrane but upon rupture the olive-brown spore-mass becoming scattered, leaving naked the distinct columella of plant tissue; sterile cells of membrane breaking up somewhat into groups, hyaline, oblong to subspherical, chiefly 7–18 μ in length; spores subspherical to spherical, smooth, contents often granular, 5.5–8.5 μ in diameter.

ON POACEAE:
Sorghum halepense, Cuba.
Sorghum vulgare, Alabama, California, Connecticut, District of Columbia, Illinois, Iowa, Kansas, Nebraska, New Jersey, New York, Ohio, Oklahoma, South Dakota, Wisconsin; Ontario; Jamaica; Cuba.

TYPE LOCALITY: Egypt, on *Sorghum vulgare*.

DISTRIBUTION: New England and Ontario to California, Alabama, Jamaica and Cuba; also in Europe, Asia and Africa.

ILLUSTRATIONS: Ann. Sci. Nat. III. 7: *pl. 5, f. 17–22;* Trans. Acad. Sci. St. Louis 7: *pl. 25, f. 1–5;* Bull. Ill. Agr. Exp. Sta. 47: *pl. 1–5;* 57: *pl. E, M, N, R 1, U;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 5, 24, 26, 38;* E. & P. Nat. Pfl. 1¹**: 9, *f. 5, D, E;* Flora 83: *pl. 3, f. 8;* Brefeld, Unters. Gesammt. Myk. 12: *pl. 7, f. 19–22;* Bull. Kan. Agr. Exp. Sta. 23: *pl. 2;* Bull. Soc. Bot. France 42: 37, *f. a–e.*

EXSICCATI: Kellerm. Ohio Fungi *4–7;* Ellis, N. Am. Fungi *1496;* Ellis & Ev. Fungi Columb. *982, 1483;* Seym. & Earle, Econ. Fungi *545, C 46, C 47, C 48;* Sydow, Ust. *117;* Griff. West Am. Fungi *213.*

2. **Sphacelotheca Seymouriana** Clinton, Proc. Bost. Soc. Nat. Hist. 31: 387. 1904.

Sori in ovaries, forming linear bodies 4–7 mm. long, or about the length of the glumes between which they extend, rupturing from apex and disclosing a distinct columella and somewhat agglutinate spore-mass; sterile cells hyaline, with those of the interior often in groups, chiefly subspherical, with those forming the membrane more irregular and adhering more permanently, about the size of the spores; spores light-brown, often with pitted con-

tents, apparently smooth, chiefly subspherical or slightly polyhedral, occasionally ovate or ovoid, 7–12 μ in length.

ON POACEAE:
Andropogon virginicus, Alabama, North Carolina.
Andropogon sp., Georgia.
TYPE LOCALITY: Auburn, Alabama, on *Andropogon virginicus*.
DISTRIBUTION: North Carolina, Georgia and Alabama.
EXSICCATI: Sydow, Ust. *189;* Seym. & Earle, Econ. Fungi *531*, *C 122*.

3. **Sphacelotheca Chrysopogonis** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 387. 1904.

Sori usually in all the ovaries of the panicle, linear-oblong, about 3–5 mm. in length, showing between the spreading glumes, with sterile membranes as well as the semi-agglutinated black-brown spore-mass gradually wearing away, leaving behind the small but evident columella; sterile cells hyaline, often separating into groups, subspherical, averaging slightly larger than the spores; spores reddish-brown, ovoid to chiefly subspherical, occasionally angled, often with punctate contents, apparently smooth, chiefly 8–11 μ in length.

ON POACEAE:
Sorghastrum nutans (*Chrysopogon nutans*), Mexico.
TYPE LOCALITY: Chapala, Mexico, on *Chrysopogon nutans* (*Sorghastrum nutans*).
DISTRIBUTION: Mexico.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 118*.

4. **Sphacelotheca Nealii** (Ellis & And.) Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 389. 1904.

Ustilago Nealii Ellis & And. Jour. Myc. **6**: 116. 1891.

Sori in the ovaries or spikelets, 0.5–2 cm. in length, oblong to ovate, often forming conspicuous nodules at basal part of spike, with evident tough whitish false membrane rupturing from apex and disclosing a black-brown semi-agglutinated spore-mass and a more or less evident columella; sterile cells hyaline, often adhering in groups, usually subspherical and larger than spores; spores reddish-brown, ovoid to chiefly subspherical, often angular, usually smooth, chiefly 7–11 μ in length.

ON POACEAE:
Heteropogon melanocarpus (*H. acuminatus*), Florida; Mexico.
TYPE LOCALITY: Lake City, Florida, on *Heteropogon melanocarpus*.
DISTRIBUTION: Florida and Mexico (Chapala and Guadalajara).
EXSICCATI: Seym. & Earle, Econ. Fungi *C 119*, *C 120*.

5. **Sphacelotheca monilifera** (Ellis & Ev.) Clinton, Jour. Myc. **8**: 141. 1902.

Ustilago monilifera Ellis & Ev. Bull. Torrey Club **22**: 362. 1895.
Ustilago Andropogonis-contorti P. Henn.; Clinton, Jour. Myc. **8**: 141, as a synonym. 1902.

Sori in ovaries of the spikelets, elongate, 4–7 mm. or about the length of the glumes and often completely concealed by them, with evident false membrane that ruptures into irregular lobes and discloses a brown-black spore-mass, with evident columella; cells of false membrane adhering rather permanently, with those of the interior in loose subspherical groups, hyaline or slightly tinted, chiefly subspherical, about the diameter of the spores; spores reddish-brown, chiefly ovoid to spherical or somewhat angled, rather minutely verruculose or echinulate, 9–13 μ in length.

ON POACEAE:
Heteropogon contortus (*Andropogon contortus*), Arizona; Mexico.
TYPE LOCALITY: Tucson, Arizona, on *Heteropogon contortus*.
DISTRIBUTION: Arizona and Mexico; also in Hawaii.
EXSICCATI: Griff. West Am. Fungi *215*.

6. **Sphacelotheca diplospora** (Ellis & Ev.) Clinton, Jour. Myc. **8**: 140. 1902.

Ustilago diplospora Ellis & Ev. Jour. Myc. **6**: 119. 1891.

Sori in the ovaries of only part of the spikelets, rather inconspicuous, showing between the spreading glumes which they rarely exceed in length, with evident false membrane that

soon ruptures and discloses an olive-black dusty spore-mass; false membrane easily separated into hyaline or slightly tinted generally subspherical cells which are also somewhat scattered in the spore-mass and are slightly larger than the spores; spores often mechanically adhering in irregular masses, reddish-brown, occasionally ovoid but chiefly subspherical or polyhedral, abundantly but minutely verruculose, 8–12 μ in length.

ON POACEAE:
Echinochloa Crus-galli (*Panicum Crus-galli*), Illinois.
Syntherisma sanguinale (*P. sanguinale*), Mississippi.
TYPE LOCALITY: Holly Springs, Mississippi, on *Panicum sanguinale* (*Syntherisma sanguinale*).
DISTRIBUTION: Illinois and Mississippi.

Sphacelotheca diplospora verruculosa Clinton, var. nov. Sori apparently in all of the ovaries of the inflorescence, with rather firm false membrane of oblong to cuboidal or rarely subspherical cells; spores evidently verruculose, 9.5–13 μ in length. ON POACEAE: *Panicum* sp., Mexico. Type collected at Lecheria, near City of Mexico, July, 1904, by C. G. Pringle, and communicated by E. W. D. Holway. Differs especially from the species in the larger more evidently verruculose spores.

Sphacelotheca diplospora glabra Clinton & Ricker, var. nov. Sori apparently in all of the ovaries of the inflorescence; spores slightly tinted to reddish-brown, apparently smooth (under an immersion rarely some of the darker-colored obscurely verruculose), 8–11 μ in length. ON POACEAE: *Panicum rottboellioides*, Cuba. Type collected at Herradura, Cuba, March 16, 1906, by A. S. Hitchcock. Differs from the species in the lighter-colored, smoother spores.

7. **Sphacelotheca pamparum** (Speg.) Clinton, Jour. Myc. 8: 140. 1902.

Ustilago Setariae "Niessl?", Speg. Anal. Soc. Ci. Argent. **10**: 5. 1880. Not *U. Setariae* Niessl.
Ustilago pamparum Speg. Anal. Soc. Ci. Argent. **17**: 89. 1884.
Ustilago Kolaczekii Kühn; Rab.-Wint. Fungi Eur. *3401*. 1886.

Sori infecting all of the ovaries of the spike, extending between the glumes as oblong bodies about 3–7 mm. in length, with evident false membrane which ruptures irregularly from apex into several elongate lobes and discloses a somewhat dusty, olive-black spore-mass and an evident columella; cells of false membrane chiefly hyaline, oblong to subspherical, adhering together rather permanently, chiefly smaller than the spores; spores reddish-brown, ovoid to spherical but chiefly polyhedral through pressure, minutely verruculose, 9–12 μ, rarely 14 μ, in length.

ON POACEAE:
Chaetochloa imberbis (*Setaria imberbis*), Cuba.
Chaetochloa (*Setaria*) sp., Mexico.
TYPE LOCALITY: Argentina, on *Setaria glauca* (*Chaetochloa glauca*).
DISTRIBUTION: Mexico; Cuba; also in South America and Europe.
EXSICCATI: Sydow, Ust. *162*.

8. **Sphacelotheca occidentalis** (Seym.) Clinton, Jour. Myc. 8: 141. 1902.

Sorosporium Ellisii occidentalis Seym.; Ell. & Ev. N. Am. Fungi *2265*. F 1889.
Ustilago Andropogonis Kellerm. & Swingle, Jour. Myc. **5**: 12. Mr 1889. (Type from Kansas, on *Andropogon furcatus*.)

Sori in the ovaries linear, usually 0.5–1 cm. or rarely longer, with prominent false membrane dehiscing from apex, with rather prominent columella and agglutinate or finally dusty black-brown spore-mass; sterile cells of membrane hyaline, variable in shape and size, adhering together rather firmly, often somewhat obscured through semi-gelatinization but the loose groups of the interior composed of more regular subspherical cells; spores often adhering together mechanically but not in spore-balls, reddish-brown, ovoid to spherical, usually somewhat angled, often more elongate and irregular, verruculose, chiefly 12–17 μ, irregular elongate forms sometimes even 20 μ, in length.

ON POACEAE:
Andropogon furcatus, Kansas, Nebraska, North Dakota.
Andropogon glomeratus (*A. macrourus*), California.
Andropogon Hallii, Illinois (cult.), Kansas, Nebraska.
TYPE LOCALITY: Bismark, North Dakota, on *Andropogon furcatus*.
DISTRIBUTION: Illinois (on cultivated plants); North Dakota to Kansas and California.
ILLUSTRATIONS: Jour. Myc. **5**: *pl. 1, f. 12–25*; Trans. Acad. Sci. St. Louis **7**: *pl. 26, f. 14–17*; Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (11)*.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2265, 2422*; Ellis & Ev. Fungi Columb. *538*.

9. **Sphacelotheca Ischaemi** (Fuckel) Clinton, Jour. Myc. 8: 140. 1902.

Ustilago Ischaemi Fuckel, Jahrb. Ver. Nat. Nass. **15**: 22. 1861.
Ustilago cylindrica Peck, Bot. Gaz. **7**: 55. 1882. (Type from Arizona, on *Andropogon* sp.)
Cintractia Ischaemi Sydow, Oesterr. Bot. Zeits. **51**: 12. 1901.

Sori often involving entire inflorescence, linear, usually enclosed by leaf-sheaths, about 10–30 mm. in length by 1–3 mm. wide, with false membrane soon rupturing and black-brown spore-mass becoming scattered, eventually leaving behind the naked columella; sterile cells besides forming false membrane also scattered through spore-mass in subspherical groups 25–40 μ in diameter, the individual cells being hyaline, subspherical, flattened where in contact, 7–18 μ in diameter; spores usually ovoid to spherical, smooth or sometimes very minutely granular, 7–10 μ in length.

ON POACEAE:
Andropogon furcatus, Kansas.
Andropogon saccharoides, Mexico.
Andropogon Torreyanus, Arizona, Texas.
Andropogon sp., Arizona.
Heteropogon contortus (*Andropogon contortus*), Arizona; Mexico.
Schizachyrium scoparium (*Andropogon scoparius*), Illinois.
TYPE LOCALITY: Biebrich, Germany, on *Andropogon Ischaemum*.
DISTRIBUTION: Kansas, Texas, Arizona, and Mexico; also in South America, Europe, Africa, and Asia.
ILLUSTRATIONS: Brefeld, Unters. Gesammt. Myk. **5**: *pl. 11, f. 1–2;* Flora **83**: *pl. 3, f. 1–6;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 7.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 44;* Ellis, Ev. & Barth. Fungi Columb. *1783;* Griff. West Am. Fungi *216, 216*[a].

10. **Sphacelotheca Paspali-notati** (P. Henn.) Clinton, Jour. Myc. 8: 140. 1902.

Ustilago Paspali-notati P. Henn.; Clinton, *loc. cit.* as a synonym. 1902.

Sori in the inflorescence, linear, about 4–6 cm. in length, with evident false membrane gradually flaking away from apex and exposing reddish-brown dusty spore-mass surrounding evident often forked columella; sterile cells hyaline, with those of the membrane adhering rather firmly, with loose ones in roundish clusters, usually larger than the spores; spores light reddish-brown, ovoid to spherical or slightly angled, apparently smooth but very minutely verruculose, 7–10 μ in length.

ON POACEAE:
Paspalum notatum, Mexico.
TYPE LOCALITY: Guadalajara, Mexico, on *Paspalum notatum*.
DISTRIBUTION: Known only from the type locality.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 121.*

11. **Sphacelotheca Panici-leucophaei** (Bref.) Clinton.

Ustilago Panici-leucophaei Bref. Unters. Gesammt. Myk. **12**: 114. 1895.
Ustilago insularis P. Henn. Hedwigia **35**: 51. 1896. (Type from Brazil, on *Tricholaena insularis.*)

Sori possibly involving the very young inflorescence but apparently chiefly in the enveloping leaves, projecting from between the leaf-sheaths as conspicuous linear bodies often 1.5 dm. in length, with the false whitish membrane flaking away, revealing the shredded longitudinal filaments of plant-tissue and the brown-black spore-mass which soon scatters; sterile cells of membrane hyaline, guttulate, separating on pressure into threads or individual cells, subspherical to oblong, 6–14 μ in length; spores reddish-brown, ovoid to chiefly subspherical or spherical, often slightly angled, easily collapsing, smooth or very minutely granular, chiefly 6–8 μ in length.

ON POACEAE:
Trichachne insulare (*Panicum leucophaeum*), Cuba; Guatemala; Jamaica; Mexico; Porto Rico.
Trichachne saccharatum (*Panicum saccharatum*), Arizona.
TYPE LOCALITY: Rio de Janeiro, Brazil, on *Panicum leucophaeum* (*Trichachne insulare*).
DISTRIBUTION: Arizona to Guatemala and Porto Rico; also in South America.
ILLUSTRATION: Brefeld, Unters. Gesammt. Myk. **12**: *pl. 6, f. 42.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 82.*

12. **Sphacelotheca Andropogonis-hirtifolii** (P. Henn.) Clinton, Jour. Myc. 8: 141. 1902.

Ustilago Andropogonis-hirtifolii P. Henn. Bot. Gaz. **28**: 274. 1899.
Ustilago Andropogonis-saccharoidis P. Henn.; Sydow, Ust. *251;* hyponym. 1901. (Type from Mexico, on *Andropogon saccharoides.*)

Sori involving the entire inflorescence, elongate, usually 5–9 cm. in length (rarely in the individual spikelets and then shorter), at first enveloped by the leaf-sheath, with promi-

nent false membrane that gradually flakes away disclosing the at first agglutinated but finally dusty olive-black spore-mass, with prominent often forked columella; sterile cells hyaline, with those of membrane adhering together rather firmly and those of interior in groups, chiefly subspherical, smaller to larger than the spores; spores reddish-brown, ovoid to chiefly subspherical or spherical, sometimes angled, often apparently smooth but really very minutely verruculose, 9–13 μ in length.

ON POACEAE:
Andropogon hirtifolius pubiflorus, Mexico.
Andropogon saccharoides, Arizona; Mexico.
TYPE LOCALITY: Patzcuaro, Michoacan, Mexico, on *Andropogon hirtifolius pubiflorus*.
DISTRIBUTION: Arizona and Mexico.
EXSICCATI: Sydow, Ust. *201*, *251*.

13. **Sphacelotheca montaniensis** (Ellis & Holway) Clinton, Jour. Myc. 8: 141. 1902.

Ustilago montaniensis Ellis & Holway (; Ellis & Ev. N. Am. Fungi *2263*; hyponym. 1889), Jour. Myc. 6: 119. 1891.

Sori in the inflorescence (more rarely in the individual spikelets and then smaller), usually enveloped by the leaves, elongate, chiefly 10–15 mm. in length, protected by an evident whitish false membrane, with small flattened columella; sterile cells of membrane and interior hyaline, thick-walled, chiefly subspherical, adhering in irregular groups that are easily separated into individual cells, usually smaller than the spores; spores dark reddish-brown, chiefly ovoid to subspherical, echinulate (sometimes rather bluntly), 12–15 μ in length.

ON POACEAE:
Muhlenbergia racemosa (*M. glomerata*), Montana.
Muhlenbergia sp., Montana.
TYPE LOCALITY: Sand Coulee, Montana, on *Muhlenbergia glomerata* (*M. racemosa*).
DISTRIBUTION: Montana.
ILLUSTRATION: Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*16*).
EXSICCATI: Ellis & Ev. N. Am. Fungi *2263*.

14. **Sphacelotheca strangulans** (Issat.) Clinton, Proc. Bost. Soc. Nat. Hist. 31: 392. 1904.

Ustilago strangulans Issat. Scripta Bot. Hort. Univ. Petrop. 5: 225. 1896.

Sori in the inflorescence, forming lanceolate to linear bodies about 8–15 mm. in length, often concealed by the leaf-sheaths, covered by a conspicuous whitish false membrane, sometimes with abortive remains of spikelets at the tip, upon rupture disclosing an olive-black dusty spore-mass within which is a conspicuous columella; sterile cells of membrane easily separated into single, twin, or a chain of several cells, hyaline, ovoid to subspherical, chiefly smaller than the spores; spores dark reddish-brown, ovoid to chiefly subspherical or spherical, conspicuously verruculose, about 12–14.5 μ in length.

ON POACEAE:
Eragrostis neo-mexicana, Arizona.
TYPE LOCALITY: Russia, on *Eragrostis poaeoides*.
DISTRIBUTION: Arizona; also in Europe.
ILLUSTRATION: Bull. Torrey Club 31: 85, *f. 7*.

15. **Sphacelotheca Reiliana** (Kühn) Clinton, Jour. Myc. 8: 141. 1902.

Ustilago Reiliana Kühn; Rab. Fungi Eur. *1998*. 1875.
Ustilago Reiliana f. *Zeae* Pass.; Rab. Fungi Eur. *2096*. 1876.
Ustilago pulveracea Cooke, Grevillea 4: 115. 1876. (Type from India, on *Zea Mays*.)
Cintractia Reiliana Clinton, Bull. Ill. Agr. Exp. Sta. 57: 346. 1900.
Ustilago (*Cintractia*) *Reiliana* f. *foliicola* Kellerm. Ohio S. U. Nat. 1: 9. 1900.

Sori very prominent, forming irregular masses including more or less of the entire panicle, usually 5–15 cm. in length, often at first protected by the leaf-sheath, with evident whitish false membrane enclosing the black-brown spore-mass and ray-like remains of the peduncles or columellas, in time becoming ruptured and spores scattered; sterile cells besides forming membrane scattered in usually subspherical groups through the spore-mass, chiefly subspherical, 7–15 μ in diameter; spores somewhat opaque, chiefly subspherical to

spherical or occasionally ovoid or slightly angled, minutely but abundantly verruculose, 9–14 μ in length.

ON POACEAE:
Sorghum vulgare, Illinois, Iowa, Kansas, Minnesota, Mississippi, Nebraska, New Jersey, Ohio, Texas.
Zea Mays, Kansas, Ohio.
TYPE LOCALITY: Egypt, on *Sorghum vulgare*.
DISTRIBUTION: New Jersey to Minnesota and Texas; also in South America, Europe, Asia and Africa.
ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 25, f. 14–18;* Bull. Ill. Agr. Exp. Sta. 57: *pl. O, R5;* Bull. Kan. Agr. Exp. Sta. 62: *pl. 4, 6, 8–10;* Brefeld, Unters. Gesammt. Myk. **5**: *pl. 11, f. 3–7;* Ohio S. U. Nat. 1: *pl. 2;* Bull. Kan. Agr. Exp. Sta. 23: *pl. 3–4.*
EXSICCATI: Seym. & Earle, Econ. Fungi *547, C 45;* Ellis & Ev. N. Am. Fungi *3564.*

16. **Sphacelotheca Hydropiperis** (Schum.) DeBary, Verg. Morph. Biol. Pilze 187. 1884.

Uredo Hydropiperis Schum. Enum. Pl. Saell. **2**: 234. 1803.
Ustilago Candollei Tul. Ann. Sci. Nat. III. **7**: 93. 1847.
Ustilago Hydropiperis Schröt. Beitr. Biol. Pfl. **2**: 355. 1877.

Sori in ovaries, forming oblong or ovate bodies about 3–5 mm. in length, protected by floral envelopes at base, with false membrane dehiscing at apex, revealing purple-black spore-mass and more or less evident columella; sterile cells besides forming membrane also constituting part of the columella, spore-like (often probably immature spores), hyaline or occasionally violet-tinted, easily separating into individual cells, chiefly subspherical, 6–17 μ; spores purplish, broadly oblong or ovate but chiefly subspherical, minutely but abundantly verruculose, mostly 10–17 μ in length.

ON POLYGONACEAE:
Persicaria Hydropiper (*Polygonum Hydropiper*), Nebraska, Rhode Island.
? *Persicaria Persicaria* (*Polygonum Persicaria*), New York.
Persicaria punctata (*Polygonum punctatum, P. acre*), Connecticut, Delaware, Illinois, Massachusetts.
Persicaria (*Polygonum*) sp., Missouri.
Tracaulon sagittatum (*Polygonum sagittatum*), Connecticut, Delaware, Illinois, Iowa, Maine, Massachusetts, Nebraska, New York, North Carolina, Vermont, West Virginia.
TYPE LOCALITY: Europe, on *Polygonum Hydropiper* (*Persicaria Hydropiper*).
DISTRIBUTION: New England to North Carolina and Nebraska; also in South America, Europe, Asia and Australia.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 3, f. 20, 21;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 6, 37;* Brefeld, Unters. Gesammt. Myk. **12**: *pl. 8, f. 16–25;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 6;* DeBary, Verg. Morph. Biol. Pilze *f. 80.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 41, C 42, C 43;* Shear, N. Y. Fungi *85;* Ellis & Ev. N. Am. Fungi *289, 2261;* Thüm. Myc. Univ. *1018;* Ellis & Ev. Fungi Columb. *336, 543.*

Sphacelotheca Hydropiperis borealis Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 395. 1904. Sorus very similar to that of the species with perhaps the false membrane not so prominent and with the columella more robust; sterile cells hyaline or slightly tinted, subspherical, thick-walled, chiefly slightly larger than the spores; spores violet-purple, ovoid to spherical or occasionally more irregular, often apparently smooth but really minutely granular, chiefly 8–11 μ in length. ON POLYGONACEAE: *Bistorta bistortoides* (*Polygonum bistortoides*), Washington, Wyoming.

3. **MELANOPSICHIUM** G. Beck, Ann. Nat. Hofmus. Wien **9**: 122. 1894.

Sori on various parts of the host, forming dark-colored, hard, firmly agglutinated and conspicuous spore-masses; spores single, developed in irregular chambers or groups arising from a mixture of plant tissue and fungous threads, thus giving a tubercular character to the sorus, enveloped by a more or less permanent gelatinous envelope, discharging from spore-mass by absorption of water, of medium size; germination as in *Ustilago*.

Type, *Ustilago austro-americana* Speg.

1. **Melanopsichium austro-americanum** (Speg.) G. Beck, Ann. Nat. Hofmus. Wien **9**: 122. 1894.

Ustilago austro-americana Speg. Anal. Soc. Ci. Argent. **12**: 63. 1881.

Sori chiefly in the inflorescence, forming more or less irregularly lobed masses arising from the fusion of the infected parts, less commonly on the leaves and then smaller, usually prominent, 2 or 3 mm. to 2 cm. in length, internally somewhat nodular or tubercular, forming a hard, firmly agglutinated, black spore-mass mixed with plant tissues; spores oblong to chiefly subspherical, often somewhat irregular, with more or less evident

gelatinous envelope, usually rather prominently echinulate, chiefly 10–14 μ, the most elongate rarely 17 μ, in length.

ON POLYGONACEAE:
Persicaria Hydropiper (*Polygonum Hydropiper*), District of Columbia, Missouri.
Persicaria incarnata (*Polygonum incarnatum*, *P. lapathifolium incarnatum*), Illinois, Iowa, Missouri.
Persicaria lapathifolia (*Polygonum lapathifolium*), California, Illinois.
Persicaria pennsylvanica (*Polygonum pennsylvanicum*), Delaware, Illinois, Kansas, Missouri, Nebraska, New Jersey, New York.
Persicaria (*Polygonum*) sp., District of Columbia, Iowa, Missouri, New Jersey, Texas.
Polygonum aviculare, California.
? *Tovara virginiana* (*Polygonum virginianum*), Missouri.
TYPE LOCALITY: Argentina, on *Polygonum acre*.
DISTRIBUTION: New York to Texas and California; also in South America.
ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 28, f. 9–12*; Ann. Nat. Hofmus. Wien **9**: *pl. 2, f. 2*.
EXSICCATI: Seym. & Earle, Econ. Fungi *372, C 35*; Rab.-Wint. Fungi Eur. *3501*; Ellis & Ev. N. Am. Fungi *2262*; Ellis, Ev. & Barth. Fungi Columb. *1940*; Roum. Fungi Sel. *4416*; Sydow, Ust. *101*.

4. CINTRACTIA Cornu, Ann. Sci. Nat. VI. 15: 279. 1883.

Anthracoidea Bref. Unters. Gesammt. Myk. **12**: 144. 1895.

Sori on various parts of the host, often in the ovaries, forming a black usually rather firmly agglutinated spore-mass; spores single, usually of medium or large size and of reddish-black color, formed in a centripetal manner from a fertile stroma usually surrounding a central columella of plant tissues, often freed from sorus by absorption of water; germination apparently of a modified *Ustilago* type.

Type, *Ustilago axicola* Berk.

Sori usually dusty at maturity. (See also no. 11.)
  Spores apparently smooth (rarely pitted).
    Spores chiefly 8–14 μ in length.
      Spores light reddish-brown. — 2. *C. Taubertiana.*
      Spores dark reddish-brown. — 4. *C. limitata.*
    Spores chiefly 12–19 μ in length.
      Spores often with lateral hyaline wings. — 1. *C. Montagnei.*
      Spores under an immersion reticulately pitted. — 3. *C. Psilocaryae.*
      Spores apparently quite smooth, irregular. — 5. *C. Cyperi.*
  Spores with coarse scales. — 6. *C. subinclusa.*
Sori usually rather firmly agglutinated at maturity.
  Sori in ovaries.
    Sori usually spherical or subspherical.
      Spores with evident hyaline envelopes. — 8. *C. externa.*
      Spores without evident hyaline envelopes.
        Spores 16–20 μ, rarely larger. — 7. *C. Caricis.*
        Spores 20–30 μ in length. — 9. *C. Luzulae.*
    Sori chiefly ovoid, rarely subspherical. — 12. *C. utriculicola.*
  Sori surrounding peduncles (rarely in inflorescence).
    Sori without prominent false membrane, linear. — 10. *C. Junci.*
    Sori with prominent white fungous membrane.
      Sori subspherical. — 11. *C. axicola.*
      Sori oblong to linear. — 13. *C. leucoderma.*

1. Cintractia Montagnei (Tul.) Magn. Abh. Bot. Ver. Prov. Brand. 37: 79. 1896.

Ustilago Montagnei Tul. Ann. Sci. Nat. III. **7**: 88. 1847.

Sori in ovaries, usually rather completely hidden by the enveloping glumes, oblong to subspherical, small, powdery or less commonly firm; spores brown or black-brown, somewhat compressed laterally and so showing oblong to polygonal or subcircular according to view, usually with remains of enveloping membrane showing as prominent hyaline lateral wings, minutely pitted, 12–19 μ, chiefly 13–16 μ, in length.

ON CYPERACEAE:
Rynchospora alba, Connecticut, Maine, New York, Vermont; Newfoundland.
Rynchospora ciliata, Florida.
Rynchospora eximia, Mexico.
Rynchospora glomerata, Connecticut, Massachusetts, Mississippi, New York.
Rynchospora lenuis, Mexico.
Rynchospora sp., North Carolina, South Carolina.
TYPE LOCALITY: Algeria, Africa, on *Schoenus* (*Rynchospora*) sp.

DISTRIBUTION: Newfoundland and New England to Florida and Mexico; also in South America, Europe and Africa.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 5, f. 31;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 9.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 7.*

2. **Cintractia Taubertiana** (P. Henn.) Clinton, Jour. Myc. **8**: 142. 1902.

Ustilago Taubertiana P. Henn. Bot. Jahrb. **17**: 525. 1893.

Similar to *C. Montagnei*, except spores medium- to light-brown, usually angular, lateral wings apparently entirely lacking, usually 8–13 μ in length.

ON CYPERACEAE:
Rynchospora alba, Massachusetts, New Jersey.
Rynchospora axillaris (*R. cephalantha*), Mississippi.
Rynchospora cymosa, Maryland.
Rynchospora fascicularis, Florida.
Rynchospora inexpansa, South Carolina.
Rynchospora sp., Alabama, Texas.
TYPE LOCALITY: Minas Geraës, Brazil, on *Rynchospora tenuis.*
DISTRIBUTION: Massachusetts to Florida and Texas; also in South America.

3. **Cintractia Psilocaryae** (Tracy & Earle) Clinton, Jour. Myc. **8**: 142. 1902.

Ustilago Psilocaryae Tracy & Earle, Bull. Torrey Club **26**: 493. 1899.

Sori in ovaries, inconspicuous, hidden by glumes, in time powdery; spores dark reddish-brown, somewhat laterally compressed and so oval to circular in cross-section according to view, usually conspicuously angled, with very dark and irregularly thickened walls (often 3 μ), under an immersion lens with the compressed sides showing faint reticulated appearance at center and pits toward the circumference, chiefly 12–15 μ in length.

ON CYPERACEAE:
Psilocarya nitens, Florida, Mississippi.
Psilocarya scirpoides, Massachusetts, Rhode Island.
TYPE LOCALITY: Horn Island, Mississippi, on *Psilocarya rynchosporoides* (*P. nitens*).
DISTRIBUTION: Massachusetts and Rhode Island; Florida and Mississippi.

4. **Cintractia limitata** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 399. 1904.

Sori in the spikelets, infecting only part, at first concealed by the enveloping glumes but with the semi-agglutinated spore-mass finally becoming powdery and showing in the vicinity of the infected spikelets as a purplish-black powder; spores chiefly dark reddish-brown, ovate or ovoid to chiefly subspherical or spherical, occasionally somewhat polyhedral, often with pitted contents, smooth, 9.5–14 μ in length.

ON CYPERACEAE:
Cyperus ligularis, Porto Rico.
TYPE LOCALITY: Mayaguez and San Juan, Porto Rico, on *Cyperus ligularis.*
DISTRIBUTION: Known only from Porto Rico.

5. **Cintractia Cyperi** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 400. 1904.

Sori in the interior of the spikelets, infecting all in the head, hidden by the enveloping glumes, scarcely modifying appearance of infected parts, so that diseased heads are told from the sound only by slightly darker color, in time shedding somewhat the brown-black granular spore-mass; spores reddish-brown, more or less agglutinated but easily broken up into single spores, oblong to polyhedral but chiefly irregular, apparently smooth but with epispore often showing darker lines due to pressure of spore-mass, 12–18 μ, or the most elongate 22 μ, in length.

ON CYPERACEAE:
Cyperus filiculmis, Connecticut.
TYPE LOCALITY: North Haven (sand plains), Connecticut, on *Cyperus filiculmis.*
DISTRIBUTION: Connecticut.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 102.*

6. **Cintractia subinclusa** (Körn.) Magn. Abh. Bot. Ver. Prov. Brand. **37**: 79. 1896.

Ustilago subinclusa Körn.; Rab. Hedwigia **13**: 159. 1874.
Anthracoidea subinclusa Bref. Unters. Gesammt. Myk. **12**: 146. 1895.

Sori in the ovaries, often concealed by the perigynium, subspherical, about 2–4 mm. in

diameter, at first agglutinated but as usually seen forming a more or less granular olive-black spore-mass; spores dark olive-brown, usually subopaque, ovoid to subspherical, occasionally more elongate and often somewhat angular, provided with coarse, tinted scales showing at circumference as truncate appendages, chiefly 14–19 μ, the most elongate rarely 22 μ, in length.

ON CYPERACEAE:
Carex abacta (*C. Michauxiana*), British America, New Brunswick.
Carex lanuginosa, Nevada, Wisconsin.
Carex lupulina, Wisconsin.
Carex oligosperma, Newfoundland.
Carex trichocarpa Deweyi, North Dakota.
Carex utriculata, Nevada, Oregon, Wisconsin.
Carex sp., Maine.
TYPE LOCALITY: Dresden, Germany, on *Carex riparia*.
DISTRIBUTION: Newfoundland to Nevada and Oregon; also in Europe.
ILLUSTRATION: Brefeld, Unters. Gesammt. Myk. **12**: *pl. 9, f. 1–3*.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1889*; Griff. West Am. Fungi *231*, *231a*, *232*.

7. **Cintractia Caricis** (Pers.) Magn. Abh. Bot. Ver. Prov. Brand. **37**: 79. 1896.

Uredo Caricis Pers. Syn. Fung. 225. 1801.
Ustilago Caricis Ung. Einfl. Bodens 211. 1836.
Ustilago urceolorum Tul. Ann. Sci. Nat. III. **7**: 86. 1847.
Ustilago Scirpi Kühn, Hedwigia **12**: 150. 1873.
Anthracoidea Caricis Bref. Unters. Gesammt. Myk. **12**: 144. 1895.

Sori in ovaries, about 3–4 mm. in diameter, at first hidden by the perigynium, then exposed as subspherical (very rarely more elongate) bodies protected by a false white membrane which soon wears away disclosing a black firmly agglutinated mass of spores, with distinct columella; sterile cells of membrane usually not very distinct because semigelatinized; spores subopaque, chiefly irregularly polyhedral, occasionally subspherical, or more elongate in lateral view, granular to papillate or sometimes indistinctly pitted, often with signs of hyaline envelope, 16–27 μ, chiefly 18–22 μ, in length.

ON CYPERACEAE:
Carex allocaulis (*C. vaginata*), Maine; Labrador.
Carex arctata, New Hampshire.
Carex Bigelovii (*C. vulgaris hyperborea*), Greenland.
Carex Buxbaumii (*C. fusca*), Pennsylvania.
Carex canescens, British Columbia, Canada.
Carex crinita, New York.
Carex Douglasii, Colorado, Nevada, Oregon, Washington.
Carex elynoides, Colorado.
Carex exilis, Massachusetts.
Carex festiva, Alaska; British Columbia.
Carex filifolia, California.
Carex folliculata australis, Mississippi.
Carex glareosa, Greenland.
Carex Gmelini, Alaska.
Carex Goodenovii (*C. turfosa*), Greenland.
Carex incurva, Greenland.
Carex invisa, British Columbia.
Carex lagopina, Islands in Bering Sea.
Carex limosa, Michigan, Wisconsin.
Carex limosa stygia, Alaska.
Carex livida, Labrador.
Carex luzulaefolia, California.
Carex magellanica, New York.
Carex marcida, Montana.
Carex monile, Vermont.
Carex nardina, Greenland.
Carex nigricans, Utah.
Carex obnupta, California.
Carex occidentalis, Wyoming.
Carex oligosperma, New York.
Carex pedunculata, Maine.
Carex pennsylvanica, Connecticut, Illinois, Iowa, Maine, Massachusetts, Minnesota, Montana, New Hampshire, New York, Pennsylvania, Rhode Island.
Carex pseudoscirpoidea, Wyoming.
? *Carex Redowskyana* (*C. dioica*), Canada.
Carex rigida, Greenland, Labrador.
Carex rupestris, Canada, Greenland.
Carex salina, Labrador.

Carex scirpoidea, Greenland; Newfoundland.
Carex siccata, Vermont; Canada.
Carex sitchensis, California.
Carex sterilis (*C. echinata microstachys*), Vermont.
Carex sterilis cephalantha (*C. echinata cephalantha*), New Hampshire, New York.
Carex straminiformis, California.
Carex stricta, Nebraska, New York, Wisconsin.
Carex tetanica, Massachusetts.
Carex umbellata, Delaware, New Hampshire, New York.
Carex umbellata vicina, Maine.
Carex utriculata, New York.
Carex varia, Ohio.
Carex variabilis, Washington.
Carex spp., California, Colorado, Massachusetts, Michigan, Missouri, New Hampshire, North Carolina, Rhode Island, Utah, Vermont, Washington, Wyoming.
Elyna Bellardi (*Kobresia scirpina*), Greenland.
Kobresia bipartita (*K. caricina*), ———.
Scirpus caespitosus, Greenland.

TYPE LOCALITY: Europe, on *Carex montana*.
DISTRIBUTION: Throughout the area containing species of *Carex*.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 4, f. 7–10;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 8, 27;* Brefeld, Unters. Gesammt. Myk. **12**: *pl. 9, f. 4–5;* Tubeuf, Diseases Pl. *f. 163;* Bull. Soc. Nat. Mosc. 40[1]: *pl. 3, f. 8;* Mem. Acad. Sci. Bologna V. **3**: 527.
EXSICCATI: Sydow, Ust. *173, 313, 314, 315;* Griff. West Am. Fungi *209, 209a, 210, 211;* Ellis & Ev. N. Am. Fungi *1090, 2259;* Shear, N. Y. Fungi *81;* Seym. & Earle, Econ. Fungi *55, C 3, C 4, C 5, C 101;* Ellis & Ev. Fungi Columb. *135, 1485.*

8. **Cintractia externa** (Griff.) Clinton, Jour. Myc. **8**: 142. 1902.

Tilletia externa Griff. Bull. Torrey Club **29**: 290. 1902.

Sori in the ovaries, subspherical, about 3 or 4 mm. in diameter, forming a firmly agglutinated black spore-mass that on absorbing moisture becomes smeared over adjacent parts, with evident small columella; spores black-brown, opaque, ovoid to spherical, smooth, provided with hyaline membranes of which the thin inner is formed by part of cell-wall and the outer by the evident remains of the fertile hypha, 17–22 μ in diameter.

ON CYPERACEAE:
Carex filifolia, Montana, Nebraska, Wyoming.
TYPE LOCALITY: Burnett's ranch, near Buffalo, Wyoming, on *Carex filifolia*.
DISTRIBUTION: Montana, Wyoming, and Nebraska.
ILLUSTRATION: Bull. Torrey Club **29**: 291, *f. 1.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 2;* Griff. West Am. Fungi *305.*

9. **Cintractia Luzulae** (Sacc.) Clinton, Jour. Myc. **8**: 143. 1902.

Ustilago Luzulae Sacc. Myc. Ven. Spec. 73. 1873.

Sori in the ovaries or occasionally extending to the base of the flowers, subspherical, about 2 mm. in diameter, usually concealed by the perianth, forming at first a firmly agglutinated but eventually a somewhat granular black spore-mass, with inconspicuous columella; spores dark-reddish to black-brown, subopaque or opaque, compressed somewhat laterally and so appearing oblong to chiefly oval or circular according to view, usually more or less angled, apparently smooth but under an immersion showing subreticulately pitted, 20–30 μ in length.

ON JUNCACEAE:
Juncoides campestre (*Luzula campestris*), Indiana.
TYPE LOCALITY: Italy, on *Luzula Forsteri*.
DISTRIBUTION: Indiana; also in Europe.
ILLUSTRATION: Sacc. Myc. Ven. Spec. *pl. 17, f. 33, 34.*

10. **Cintractia Junci** (Schw.) Trel. Bull. Torrey Club **12**: 70. 1885.

Caeoma Junci Schw. Trans. Am. Phil. Soc. II. **4**: 290. 1832.
Ustilago Junci Curt. Cat. Pl. N. Car. 123. 1867.
Ustilago Liebmanni P. Henn. Hedwigia **33**: 229. 1894. (Type from Mexico, on *Juncus* sp., not *Luzula* sp., as stated.)

Sori usually linear, surrounding peduncles and pedicels for more or less of their length, sometimes in basal parts of the flowers and even occasionally filling the ovaries, forming an agglutinated black spore-mass; sterile cells usually not evident since inconspicuous and early evanescent; spores black-brown, subopaque, more or less agglutinated, somewhat

compressed laterally and so appearing oblong to irregularly polygonal or subcircular according to view, minutely pitted, 14–22 μ in length.

ON JUNCACEAE:
Juncus acuminatus, Mississippi.
Juncus effusus, New Jersey.
Juncus tenuis, Connecticut, Illinois, Iowa, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, Vermont, Wisconsin.
Juncus sp., Massachusetts, North Carolina; Mexico.
TYPE LOCALITY: Bethlehem, Pennsylvania, on *Juncus tenuis*.
DISTRIBUTION: New England to Wisconsin, North Carolina, and Mexico; also in South America.
ILLUSTRATIONS: Bull. Torrey Club **12**: *pl. 50*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 28*.
EXSICCATI: Seym. & Earle, Econ. Fungi *51, C 6, C 103*; Ellis & Ev. Fungi Columb. *472*; Kellerm. Ohio Fungi *66*; Ellis & Ev. N. Am. Fungi *290*; Thüm. Myc. Univ. *1622*; Rab.-Wint. Fungi Eur. *2901*.

11. **Cintractia axicola** (Berk.) Cornu, Ann. Sci. Nat. VI. **15**: 279. 1883.

Ustilago axicola Berk. Ann. Mag. Nat. Hist. II. **9**: 200. 1852.
Ustilago axicola var. Berk. Grevillea **3**: 59. 1874.
Ustilago Fimbristylis Thüm. Bull. Torrey Club **6**: 95. 1876. (Type from Virginia, on *Fimbristylis autumnalis*.)

Sori usually at base of peduncles or pedicels, rarely in the spikelets, usually roundish, about 3–5 mm. in diameter, at first with whitish false membrane covering the olive-black agglutinated spore-mass, but this soon disappearing and spores becoming less firmly agglutinated; sterile cells usually indefinite through gelatinization of wall, cellular or somewhat thread-shaped, with little or no lumen; spores reddish-brown, compressed laterally and so appearing oblong to subcircular according to view, often somewhat angled, smooth, 12–18 μ in length.

ON CYPERACEAE:
Fimbristylis autumnalis, Alabama, Delaware, Mississippi, Virginia.
Fimbristylis diphylla, Porto Rico.
Fimbristylis Holwayana, Mexico.
Fimbristylis sp., Costa Rica, Cuba, Jamaica, Mexico, San Domingo, St. Kitts.
TYPE LOCALITY: San Domingo, on "some scirpoid plant" [*Fimbristylis* sp.].
DISTRIBUTION: Delaware to Mississippi, Mexico, Costa Rica, and the West Indies.
ILLUSTRATION: Ann. Sci. Nat. VI. **15**: *pl. 15, f. 1–3*.
EXSICCATI: Seym. & Earle, Econ. Fungi *530*; Sydow, Ust. *219*.

Cintractia axicola minor Clinton, Jour. Myc. **8**: 143. 1902. Spores smaller, 10–13 μ in length. ON CYPERACEAE: *Cyperus Grayii*, New York; *Cyperus sphacelatus*, Porto Rico. EXSICCATI: Ellis & Ev. N. Am. Fungi *2423*.

12. **Cintractia utriculicola** (P. Henn.) Clinton, Jour. Myc. **8**: 143. 1902.

Cintractia leucoderma f. *utriculicola* P. Henn. Hedwigia **34**: 336. 1895.
Cintractia axicola f. *spicularum* Juel, Bih. K. Sv. Vet.-Akad. Handl. **23(3)**[10]: 7. 1897.

Sori in ovaries, ovoid to subspherical, chiefly 3–6 mm. in length, covered by evident whitish false membrane that ruptures irregularly from the apex disclosing a semi-agglutinated black spore-mass; sterile cells hyaline, chiefly subspherical, usually semigelatinized; spores dark reddish-brown, often subopaque, with irregular lighter areas, somewhat compressed laterally and so appearing oblong to circular according to view, smooth, 11–16 μ in length.

ON CYPERACEAE:
Rynchospora corymbosa (*R. aurea*), Porto Rico.
Rynchospora sp., Mexico.
TYPE LOCALITY: Brazil, on *Rynchospora gigantea*.
DISTRIBUTION: Porto Rico and Mexico; also in South America.
EXSICCATI: Seym. & Earle, Econ. Fungi *105*; Sydow, Ust. *220*.

13. **Cintractia leucoderma** (Berk.) P. Henn. Hedwigia **34**: 335. 1895.

Ustilago leucoderma Berk. Ann. Mag. Nat. Hist. II. **9**: 200. 1852.
Cintractia Krugiana Magn. Bot. Jahrb. **17**: 490. 1893. (Type from Porto Rico, on *Rynchospora gigantea*.)
Cintractia affinis Peck, N. Y. State Mus. Bull. 67: 28. 1903. (Type from New York, on *Rynchospora macrostachya*.)

Sori surrounding peduncles or pedicels or often involving base of the rachis (sometimes even on stems), forming conspicuous elongate bodies 7–30 mm. in length, covered with a thick white false membrane that gradually flakes away, leaving exposed the firmly

agglutinated black spore-mass; sterile cells more or less gelatinized, often almost in fragments; spores medium to dark reddish-brown, somewhat compressed laterally and so appearing oblong to circular according to view, occasionally obtusely angled, at times with hyaline fragments still attached, verruculose though sometimes rather obscurely, 13–16 μ, rarely 18 μ or even 20 μ, in length.

ON CYPERACEAE:
Rynchospora corniculata, Florida.
Rynchospora corniculata macrostachya (*R. macrostachya*), New York.
Rynchospora gigantea, Porto Rico.
Rynchospora Tracyi, Florida.
Rynchospora sp., Mexico.
? *Rynchospora*, Cuba, San Domingo.
TYPE LOCALITY: San Domingo, "on the sheaths of some sedge" [probably *Rynchospora* sp.].
DISTRIBUTION: New York, Florida, Cuba, San Domingo, Porto Rico, Mexico; also from South America, Asia and Australia.
ILLUSTRATION: Bot. Jahrb. **17**: 490.
EXSICCATI: Sydow, Ust. *224;* Seym. & Earle, Econ. Fungi *C 104.*

5. SCHIZONELLA Schröt. Beitr. Biol. Pfl. 2: 362. 1877.

Sori in the leaves, forming black agglutinated spore-masses; spores in pairs, produced serially in the fertile threads, arising by internal division of a mother cell, usually becoming somewhat laxly connected by the bulging of contiguous surfaces or sometimes separating into individual cells, of medium size; germination by means of a short promycelium, the cells of which give rise to sporidia as with *Ustilago*.

Type, *Uredo melanogramma* DC.

1. Schizonella melanogramma (DC.) Schröt. Beitr. Biol. Pfl. 2: 352. 1877.

Uredo melanogramma DC. Fl. Fr. **6**: 75. 1815.
Ustilago ambiens Karst. Oefv. K. Sv. Vet.-Akad. Förh. **29**[2]: 108. 1872. (Type from Spitzbergen.)
Urocystis pusilla Cooke & Peck; Peck, Rep. N. Y. State Mus. **25**: 90. 1873. (Type from New York, on *Carex pennsylvanica*.)
Geminella melanogramma Magn. Hedwigia **14**: 19. 1875.
Entyloma ambiens Johans. Oefv. K. Sv. Vet.-Akad. Förh. **41**[9]: 160. 1885.

Sori in the leaves, chiefly epiphyllous, linear, 1–2 mm., or often by terminal fusion of considerable length, forming rather permanently agglutinated black striae; spores dark reddish-brown, often with the cells becoming partially or entirely separated by the bulging of the contiguous sides, chiefly ellipsoidal to hemispherical or, when separated into cells, polyhedral to subspherical, chiefly 8–12 μ in length.

ON CYPERACEAE:
Carex atratiformis (*C. atrata*), Colorado.
Carex Hoodii, Utah.
Carex laxiflora, Illinois.
Carex pennsylvanica, Colorado, Connecticut, Illinois, Iowa, Massachusetts, Michigan, New York, Wisconsin.
Carex sp., California, Colorado, Indiana, Michigan, Nevada, Oregon, Utah, Wyoming.
TYPE LOCALITY: Jura, Europe, on *Carex montana*.
DISTRIBUTION: New England to Oregon and California; also in South America and Europe.
ILLUSTRATIONS: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 9, 35;* Brefeld, Unters. Gesammt. Myk. **12**: *pl. 9, f. 6–12;* Beitr. Biol. Pfl. **2**: *pl. 12, f. 6.*
EXSICCATI: Thüm. Myc. Univ. *928;* Ellis, N. Am. Fungi *291;* Seym. & Earle, Econ. Fungi *56, C 36, C 37;* Ellis & Ev. Fungi Columb. *474;* Griff. West Am. Fungi *225.*

6. MYKOSYRINX G. Beck, Ann. Nat. Hofmus. Wien **9**: 123. 1894.

Sori in the interior of the pedicels and peduncles of the inflorescence, forming a double-layered fertile stroma lining these and giving rise to a dusty spore-mass which fills the hollowed organs; spores in pairs, formed from mother-cells produced singly in the ends of short hyphae, with cells eventually becoming loosely connected by bulging of contiguous surfaces; germination not known (?).

Type, *Uredo Cissi* DC.

1. **Mykosyrinx Cissi** (DC.) G. Beck, Ann. Nat. Hofmus. Wien **9**: 123. 1894.

Uredo Cissi DC. in Poir. Encycl. Meth. Bot. **8**: 228. 1808.
Geminella exotica Schröt. Hedwigia **15**: 135. 1876. (Type from Brazil, on *Cissus sicyoides*.)
Geminella exotica Decandollei Fisch de Waldh. Aperçu Syst. Ust. 43. 1877.
Schroeteria Cissi De-Toni; Sacc. Syll. Fung. **7**²: 501. 1888.

Sori in peduncles and pedicels of the inflorescence, distorting the infected parts somewhat and filling their interior with a dusty purple-black spore-mass; spores dark reddish-brown, subopaque, chiefly subspherical, spherical, or occasionally slightly angled, two-celled, with a common enveloping outer membrane which ruptures at juncture of cells allowing these to separate at their margins though still attached at the bulging centers, smooth, about 11–14 μ (individual cells) in length.

ON VITACEAE:
Cissus acida, Porto Rico.
Cissus erosa, Porto Rico.
Cissus sicyoides, Florida; Bahamas; Jamaica; Porto Rico; San Domingo.
Cissus sp., Cuba; Dominica; Mexico.
Vitaceae, Haiti; Mexico.
TYPE LOCALITY: San Domingo, on *Cissus sicyoides*.
DISTRIBUTION: Florida; Mexico; West Indies; also in South America and Africa.
ILLUSTRATIONS: Malpighia **13**: 522–530; Ann. Nat. Hofmus. Wien **9**: *pl. 2, f. 3*.
EXSICCATI: Krypt. Exs. Ed. Mus. Pal. Vind. *11*; Sydow, Ust. *48*.

7. **SOROSPORIUM** Rud. Linnaea **4**: 116. 1829.

Sori in various parts of the host, forming dusty dark-colored spore-masses; spore-balls composed of numerous fertile cells, often rather loosely united and frequently at maturity completely separating, of medium size; spores usually olive- or reddish-brown, of medium size; germination similar to that of *Ustilago*, sometimes with elongate germ-thread and no sporidia.

Type, *Sorosporium Saponariae* Rud.

Sori in the ovaries, usually small.
  Spore-balls quite temporary.
    Spores 6–9 μ in length. — 1. *S. consanguineum*.
    Spores 11–16 μ in length. — 2. *S. Eriochloae*.
  Spore-balls rather permanent.
    Spores 8–12 μ, light reddish-brown. — 3. *S. Everhartii*.
    Spores 10–16 μ, dark reddish-brown. — 9. *S. Rhynchosporae*.
Sori aborting the inflorescence, very elongate.
  Spore-balls composed of many spores.
    Spores rather thin-walled.
      Spores 9–13 μ in length.
        Spores chiefly smooth. — 4. *S. contortum*.
        Spores chiefly verruculose. — 5. *S. Syntherismae*.
      Spores 12–19 μ in length. — 6. *S. Ellisii*.
    Spores rather thick-walled (3 μ). — 7. *S. provinciale*.
  Spore-balls of few spores, usually 6–20. — 8. *S. granulosum*.

1. **Sorosporium consanguineum** Ell. & Ev. Jour. Myc. **3**: 56. 1887.

Ustilago Aristidae Peck, Bull. Torrey Club **12**: 35. 1885. (Type from Texas, on *Aristida* sp.)
? Not *Sorosporium Aristidae* Neger. 1896.

Sori in ovaries, entirely enclosed by glumes though often somewhat visible through these; spore-balls oblong to subspherical, more or less irregular, at first firm but with age usually becoming entirely dissolved, about 80–135 μ in length; spores reddish-brown, ovoid to subspherical but chiefly polyhedral, smooth, mostly 6–9 μ in length.

ON POACEAE:
Aristida arizonica (*A. Rusbyi*), Arizona.
Aristida basiramea, South Dakota.
Aristida longiseta (*A. purpurea*), Nebraska.
Aristida longiseta robusta, Nebraska.
Aristida purpurascens, Colorado.
Aristida Schiedeana, Arizona.
Aristida sp., Kansas, Texas; Mexico.
TYPE LOCALITY: Northern Arizona, on "*Aristida Rusbyi*" (*A. arizonica*).
DISTRIBUTION: South Dakota to Mexico.

ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 25, f. 19–23;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114 (19).*
EXSICCATI: Ellis & Ev. Fungi Columb. *1600;* Griff. West Am. Fungi *214, 214a.*

2. **Sorosporium Eriochloae** Griff. Bull. Torrey Club **31**: 84. 1904.

Sori in ovaries, oblong, about 2–3 mm. in length, more or less concealed by the enveloping glumes, with a conspicuous whitish false membrane that ruptures in lobes from the apex disclosing a blackish somewhat agglutinated spore-mass and a small columella; sterile cells of false membrane adhering together rather firmly, chiefly cubical to 2–3 times as long as broad, occasionally more rounded; spore-balls rather irregular but chiefly ovoid to subspherical, soon separating into spores, usually 60–100 μ in length; spores somewhat agglutinated, dark reddish-brown, ovoid to subspherical or occasionally polyhedral, smooth or minutely verruculose, 11–16 μ in length.

ON POACEAE:
Monachne punctata (*Eriochloa punctata*), Arizona.
TYPE LOCALITY: Empire Ranch, Santa Rita Mountains, Arizona, on *Eriochloa punctata* (*Monachne punctata*).
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Bull. Torrey Club **31**: 85, *f. 13–16.*

3. **Sorosporium Everhartii** Ellis & Gall. Jour. Myc. **6**: 32. 1890.

Tolyposporium Everhartii Dietel, in E. & P. Nat. Pfl. 1^{1**}: 14. 1897.

Sori in ovaries of the spikelets, linear, about 1–2 cm. in length, with prominent false membrane dehiscing from apex into several lobes, with black-brown agglutinated spore-mass that wears away from apex disclosing the flattened columella of plant tissue; spore-balls oblong to subspherical, composed of many rather firmly agglutinated spores, usually 55–125 μ in length; spores reddish-brown, inner often nearly hyaline, polyhedral or sometimes ovoid to subspherical, smooth or outermost spores granular-verruculose, chiefly 8–12 μ in length.

ON POACEAE:
Andropogon glomeratus (*A. macrourus*), Florida.
Andropogon virginicus, Alabama, Georgia, Mississippi, New Jersey.
Schizachyrium scoparium (*Andropogon scoparius*), Alabama, Connecticut.
TYPE LOCALITY: Newfield, New Jersey, on *Andropogon virginicus.*
DISTRIBUTION: Connecticut to Florida and Mississippi.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2265 (b);* Sydow, Ust. *190;* Ellis & Ev. Fungi Columb. *473;* Seym. & Earle, Econ. Fungi *74, C 115;* Rav. Fung. Car. II. *98.*

4. **Sorosporium contortum** Griff. Bull. Torrey Club **31**: 83. 1904.

Sori in the inflorescence, forming linear bodies often 3–5 cm. in length, with basal part concealed by leaves but apical end exposed, rupturing upon maturity and scattering the black granular spore-mass and leaving behind the prominent shredded false membrane and the filaments of plant tissue; spore-balls opaque, ovoid to subspherical or occasionally more irregular, firm, composed of many spores, chiefly 50–90 μ in length; sterile membrane composed of hyaline thick-walled cells rather firmly bound together and cubical or 2–3 times as long as broad; spores reddish-brown, interior ones often scarcely colored, ovoid to subspherical or polyhedral, smooth or outer ones becoming obscurely verruculose, 9–13 μ in length.

ON POACEAE:
Heteropogon contortus (*Andropogon contortus*), Arizona; Mexico.
TYPE LOCALITY: Santa Rita Mountains, Arizona, on *Andropogon contortus* (*Heteropogon contortus*).
DISTRIBUTION: Arizona and Mexico (Guadalajara).
ILLUSTRATION: Bull. Torrey Club **31**: 85. *f. 1–3.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 114.*

5. **Sorosporium Syntherismae** (Peck) Farl.; Farl. & Seym. Host Index N. Am. Fungi 152. 1891.

Ustilago Syntherismae Peck, Ann. Rep. N. Y. State Mus. **27**: 103. 1875.
Sorosporium Cenchri P. Henn. Hedwigia **35**: 221. 1896. (Type from Brazil, on *Cenchrus echinatus.*)

Sori involving entire inflorescence, elongate, 3–7 cm. in length, or rarely limited to

individual spikelets and then shorter, protected by leaf-sheaths, provided with false membrane that ruptures from apex down disclosing black-brown spore-mass and shredded filaments of plant tissue; sterile cells of membrane hyaline, oblong to cubical or subspherical, with tendency to adhere in filaments when separated; spore-balls rather evanescent, variable in shape and size, irregularly oblong to subspherical, 40–100 μ in length; spores very minutely verruculose, inner often appearing smooth, subspherical or somewhat polyhedral to occasionally more elongate, chiefly 9–13 μ in length.

ON POACEAE:
Cenchrus echinatus, Mexico (Guadalajara).
Cenchrus multiflorus, Mexico.
Cenchrus tribuloides, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, New York, South Dakota, Texas, Wisconsin.
Cenchrus sp., Kansas, Texas; Mexico.
Panicum agrostoides, Missouri.
Panicum capillare, Indiana, Iowa, Kansas, Massachusetts, Nebraska, South Dakota.
Panicum hirticaulum, Arizona.
Panicum proliferum, Delaware, District of Columbia, Illinois, Iowa, Kansas, Missouri, Nebraska, North Carolina, Ohio.
Panicum sp., Kansas, Missouri.
TYPE LOCALITY: New York, on *Cenchrus tribuloides*.
DISTRIBUTION: New England to North Carolina, South Dakota, and Mexico; also in South America.
ILLUSTRATIONS: Trans. Acad. Sci. St. Louis **7**: *pl. 26, f. 1, 2, 6–13, pl. 27, f. 1–3, 9–12;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 7, 36;* Bull. Iowa Agr. Exp. Sta. 54: *f. 114* (*3, 5, 6*).
EXSICCATI: Seym. & Earle, Econ. Fungi *66, 398, C 39, C 40, C 116, C 117;* Ellis & Ev. Fungi Columb. *646, 748, 1785, 1786;* Sydow, Ust. *163, 348;* Ellis & Ev. N. Am. Fungi *1890a, 2260a, 2260b;* Griff. West Am. Fungi *30;* Kellerm. Ohio Fungi *41*.

6. **Sorosporium Ellisii** Wint. Hedwigia **22**: 2. Ja 1883. — Bull. Torrey Club **10**: 7. Ja 1883.

Sori elongate, including the entire inflorescence or more rarely confined to the individual spikelets, chiefly 1–5 cm. in length, often hidden by enveloping leaf-sheaths, provided with evident false membrane, within which is the black-brown dusty spore-mass; spore-balls dark reddish-brown, subopaque, rather temporary, oblong to subspherical, chiefly 40–100 μ in length; spores somewhat irregular, oblong to chiefly subspherical or polyhedral, thick-walled (wall often irregularly thickened and lighter-colored where spores have been in contact), verruculose, chiefly 12–19 μ in length.

ON POACEAE:
Andropogon virginicus, New Jersey.
Aristida dicholoma, Ohio, Pennsylvania.
Schizachyrium scoparium (*Andropogon scoparius*), Connecticut, Illinois, Kansas.
TYPE LOCALITY: Newfield, New Jersey, on *Andropogon virginicus*.
DISTRIBUTION: Connecticut and New Jersey to Kansas.
ILLUSTRATION: Trans. Acad. Sci. St. Louis **7**: *pl. 26, f. 3, pl. 29, f. 6–8*.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 38;* Ellis & Ev. N. Am. Fungi *1099, 1494*.

7. **Sorosporium provinciale** (Ellis & Gall.) Clinton, Jour. Myc. **8**: 145. 1902.

Sorosporium Ellisii provincialis Ellis & Gall. Jour. Myc. **6**: 31. 1890.

Sori in the inflorescence, linear, often 6 cm. or more in length, concealed within the leaf-sheath or upper part protruding, with false membrane that becomes lacerated exposing the black-brown granular spore-mass; spore-balls variable, apparently gradually wearing away, chiefly 50–100 μ or possibly even longer; spores medium-light reddish-brown though often darker in places, rather regular, ovoid to chiefly subspherical, minutely verruculose, with thick uniform cell-wall (3 μ), 14–19 μ in length.

ON POACEAE:
Andropogon furcatus, Missouri, Nebraska.
TYPE LOCALITY: Saline County, Missouri, on *Andropogon provincialis* (*A. furcatus*).
DISTRIBUTION: Missouri and Nebraska.
ILLUSTRATION: Bull. Iowa Agr. Exp. Sta. 54: *f. 120* (*12*).
EXSICCATI: Ellis & Ev. N. Am. Fungi *2425*.

8. **Sorosporium granulosum** Ellis & Tracy, Jour. Myc. **6**: 77. 1890.

Sori taking the place of the aborted inflorescence, linear, usually enclosed in the leaf-sheaths, forming an agglutinated brown-black spore-mass; spore-balls reddish- to black-

brown, usually opaque, ovoid to spherical, quite firm, composed of 6–20 or more spores, chiefly 40–80 μ in length; spores dark reddish-brown, ovoid to spherical or polyhedral, smooth, about 12–17 μ in length.

ON POACEAE:
Stipa comata, Wyoming.
Stipa viridula, Colorado.
TYPE LOCALITY: Trinidad, Colorado, on *Stipa viridula*.
DISTRIBUTION: Colorado and Wyoming.

9. **Sorosporium Rhynchosporae** P. Henn. Hedwigia **35**: 222. 1896.

Sori in ovaries, completely concealed by the glumes, more or less subspherical, about 1 or 2 mm. in length, forming a granular black spore-mass; spore-balls dark-reddish to black-brown, opaque, oblong to subspherical, more or less angular, rather firmly agglutinated, usually of about 6–20 spores, 25–45 μ in length; spores dark reddish-brown, oblong to spherical, with sides more or less angled, apparently smooth or obscurely verrucose, chiefly 10–16 μ in length.

ON CYPERACEAE:
Rynchospora semiplumosa, Mississippi.
TYPE LOCALITY: Rio de Janeiro, Brazil, on *Rynchospora glauca*.
DISTRIBUTION: Mississippi; also in South America.

EXCLUDED SPECIES

Sorosporium Borrichiae Ellis & Ev.; Millsp. Field Columb. Mus. Publ. Bot. **2**: 16. 1900. On *Borrichia argentea*. = *Sterigmatocystis*.

8. **THECAPHORA** Fingerh. Linnaea **10**: 230. 1835.

Poikilosporium Dietel, Flora **83**: 87. 1897.

Sori in various parts of the host, often as indefinite masses in the floral parts or forming rather firm pustules on the stem, at maturity with a dusty spore-mass; spore-balls composed of few to many fertile cells, rather permanently united, of small to medium large size; spores usually yellowish or reddish, smooth on contiguous sides but usually marked on the free surface; germination, so far as known, by means of a single sporidium at tip of the elongate septate promycelium.

Type, *Thecaphora hyalina* Fingerh.

Sori pustular, 2–5 mm., on various parts of hosts.
  Spore-balls of 2–6 spores. — 1. *T. pilulaeformis.*
  Spore-balls of 15–30 spores. — 6. *T. mexicana.*
  Spore-balls of 50 or more spores.
    Host: *Boerhaavia*. — 7. *T. tunicata.*
    Host: *Cladothrix*. — 8. *T. Thornberi.*
Sori indefinite, in the inflorescence.
  Sori in the flower heads.
    Spore-balls of 2–6 spores. — 2. *T. Trailii.*
    Spore-balls of 7–20 spores. — 3. *T. californica.*
    Spore-balls of 40–75 spores. — 4. *T. cuneata.*
  Sori inside bracts of staminate spikes. — 9. *T. aterrima.*
Sori in the seeds. — 5. *T. deformans.*

1. **Thecaphora pilulaeformis** B. & C. Grevillea **3**: 58. 1874.

Tolyposporium Davidsonii Dietel & Holway, Bot. Gaz. **19**: 305. 1894. (Type from California, on *Isocoma veneta*; not on *Atriplex*, as stated.)
Poikilosporium Davidsohnii Dietel, Flora **83**: 87. 1897.
Poecilosporium Davidsohnii Sacc. & Sydow; Sacc. Syll. Fung. **16**: 380. 1902.
Sorosporium Bigeloviae Griff. Bull. Torrey Club **29**: 295. 1902. (Type from Arizona, on *Bigelovia* sp.)

Sori taking the place of the aborted inflorescence or often at the base of the leaves, subspherical, small, forming firm usually clustered pustules, upon dehiscence disclosing light-colored spore-mass; spore-balls somewhat irregular, chiefly 2–6-spored, 14–25 μ in length; spores yellowish, quite variable through pressure, oblong to polyhedral or often three-sided in cross-section, with contiguous sides flattened and smooth but with the curved free surface rather abundantly verruculose, chiefly 11–16 μ in length.

ON CARDUACEAE:
Isocoma veneta (*Bigelovia veneta*), California.
Isocoma (*Bigelovia*) sp., Arizona.
TYPE LOCALITY: California, on *Bigelovia veneta* (*Isocoma veneta*).

DISTRIBUTION: California and Arizona.
ILLUSTRATIONS: Bull. Torrey Club **29**: 295, *f. 4*; E. & P. Nat. Pfl. 1[**]: 13, *f. 8, C, D*; Bot. Gaz. **19**: *pl. 29, f. 5–8*; Flora **83**: *pl. 3, f. 14*.
EXSICCATI: Griff. West Am. Fungi *399*.

2. **Thecaphora Trailii** Cooke, Grevillea **11**: 155. 1883.

Thecaphora Cirsii Boud. Bull. Soc. Myc. Fr. **3**: 149. 1887. (Type from France, on *Cirsium anglicum*.)
Schizonella subtrifida Ellis & Ev. (N. Am. Fungi *2266*; hyponym. 1889) Jour. Myc. **6**: 119. 1891. (Type from Colorado, on *Cirsium ochrocentrum*.)
Poikilosporium Trailii Vesterg. Micr. Rar. Sel. *452*. 1902.

Sori apparently rather indefinite in the flower-heads causing more or less abortion and distortion, at maturity shedding out reddish or purplish-brown dusty spore-mass; spore-balls chiefly subspherical, composed of 2–4 or rarely 5 or 6 spores, very often separating at maturity, about 20–30 μ in diameter; spores reddish-brown, usually hemispherical or three-sided or occasionally even more irregular, with contiguous sides flat and smooth, the free surface rounded and provided with more or less evident reticulations that show at circumference as rather prominent verruculations, chiefly 12–18 μ in length.

ON CARDUACEAE:
Carduus leiocephalus, Utah.
Carduus ochrocentrus (*Cnicus ochrocentrus*), Colorado.
TYPE LOCALITY: Scotland, on *Carduus heterophyllus*.
DISTRIBUTION: Utah and Colorado; also in Europe.
ILLUSTRATION: Bull. Soc. Myc. Fr. **3**: *pl. 15, f. 1*.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2266*.

3. **Thecaphora californica** (Hark.) Clinton, Jour. Myc. **8**: 146. 1902.

Sorosporium californicum Hark. Bull. Calif. Acad. Sci. **1**: 161. 1885.

Sori rather indefinite in the flower-heads, more or less destroying the florets; spore-balls rather firm, chiefly subspherical, composed of 7–20 spores, 22–38 μ in diameter; spores light yellowish-brown, chiefly triangular to polygonal or subcircular in cross-section, with contiguous sides flat and smooth and free surfaces rounded and prominently verruculose, chiefly 11–17 μ in length.

ON CARDUACEAE:
Grindelia robusta, California.
TYPE LOCALITY: Antioch, California, on *Grindelia robusta*.
DISTRIBUTION: California.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1495*; Rab.-Wint. Fungi Eur. *3504*.

4. **Thecaphora cuneata** (Schof.) Clinton, Jour. Myc. **8**: 146. 1902.

Sorosporium cuneatum Schof. Contr. Bot. Dep. Univ. Neb. **3**: 48. 1892.
Sorosporium Solidaginis Ellis & Ev. Proc. Acad. Nat. Sci. Phila. **1893**: 156. 1893. (Type from Kansas, on *Solidago missouriensis*.)

Sori rather indefinite in the flower-heads causing more or less abortion and distortion; spore-balls ovoid to subspherical, rather firm, composed of numerous (chiefly 40–75) spores, 40–80 μ in length; spores reddish-brown, in cross-section usually wedge-shaped, with outer free surface rounded and prominently verruculose, chiefly 14–22 μ in length.

ON CARDUACEAE:
Grindelia squarrosa, Kansas, Nebraska.
Solidago missouriensis, Kansas.
TYPE LOCALITY: Lincoln, Nebraska, on *Grindelia squarrosa*.
DISTRIBUTION: Kansas and Nebraska.
ILLUSTRATION: Trans. Acad. Sci. St. Louis **7**: *pl. 27, f. 4, 5*.
EXSICCATI: Ellis & Ev. N. Am. Fungi *3565*; Ellis & Ev. Fungi Columb. *1282*.

5. **Thecaphora deformans** Dur. & Mont.; Tul. Ann. Sci. Nat. III. **7**: 110. 1847.

Thecaphora Lathyri Kühn; Rab. Fungi Eur. *1797*. 1874.
Thecaphora affinis W. G. Schneid. (Jahresb. Schles. Ges. **52**: 90; name. 1875); Fisch. de Waldh. Aperçu Syst. Ust. 36. 1877. (Type from Silesia, on *Astragalus Glycyphyllos*.)
Sorosporium Desmodii Peck, Bot. Gaz. **3**: 35. 1878. (Type from New Jersey, on *Desmodium acuminatum*.)
Sorosporium Astragali Peck, Bot. Gaz. **4**: 218. 1879. (Type from Colorado, on *Astragalus Drummondii*.)
Thecaphora Astragali Woronin; Farl. & Seym. Host Index N. Am. Fungi 25. 1888.
Thecaphora Desmodii Woronin; Farl. & Seym. Host Index N. Am. Fungi 26. 1888.

Sori in the seeds, showing when the legumes are broken open as reddish-brown dusty spore-masses which have destroyed most of the seeds; spore-balls reddish-brown, ovoid to spherical, rather firm, composed of 3–25 (usually 7–12) spores, chiefly 27–60 μ in length; spores in optical section triangular to polygonal or when free also showing irregular oblong forms, on free surface provided with usually prominent papillae that sometimes vary to spiny processes, 15–25 μ, chiefly 15–20 μ, in length.

ON FABACEAE:
Astragalus bisulcatus, Colorado.
Astragalus Drummondii, Colorado.
Astragalus missouriensis, Utah.
Astragalus Nuttallianus, Arizona.
Astragalus scopulorum, Colorado.
Astragalus sp., Arizona.
Homalobus tenellus (*Astragalus multiflorus*), Utah.
Lotus humistratus, Arizona.
Lotus micranthus (*Hosackia parviflora*), Washington.
Lupinus sp., Colorado.
Meibomia grandiflora (*Desmodium acuminatum*), New Jersey.
Meibomia nudiflora (*Desmodium nudiflorum*), Maryland, Pennsylvania.
Trifolium tridentatum, California.
Vicia americana, Utah.
Vicia caroliniana, New York.

TYPE LOCALITY: Mascara, Algeria, on *Medicago tribuloides*.

DISTRIBUTION: New York to Maryland; Colorado to Washington and Arizona; also in Europe and Africa.

ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 4, f. 23;* Brefeld, Unters. Gesammt. Myk. **5**: *pl. 11, f. 8–12.*

EXSICCATI: Ellis & Ev. Fungi Columb. *136;* Ellis & Ev. N. Am. Fungi *1100, 2264;* Griff. West Am. Fungi *331;* Seym. & Earle, Econ. Fungi *C 49, C 123.*

6. **Thecaphora mexicana** Ellis & Ev.; Clinton, Jour. Myc. **8**: 146. 1902.

Sori on stems, prominent, forming clustered subglobose pustules each about 4 mm. in diameter, firm, upon rupture scattering dusty umber spore-mass and leaving behind the remains of the hollowed pustules; spore-balls light reddish-yellow, ovoid to spherical, composed of 15–30 spores separated by prominent hyaline areas that apparently widen with maturity, 50–90 μ in length; spores angular when young but with age becoming more rounded, irregular, oblong to polyhedral or subspherical, with distinct inner and outer coats, the latter thick and provided with prominent irregular papillae, chiefly 16–22 μ, the most elongate rarely 25 μ, in length.

ON CARDUACEAE:
Guardiola platyphylla, Mexico.

TYPE LOCALITY: Mexico, on *Guardiola platyphylla.*

DISTRIBUTION: Known only from the type locality.

7. **Thecaphora tunicata** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 422. 1904.

Sori in the flowers, forming subspherical bodies about 2–3 mm. in diameter, enclosed by the floral envelopes, at first firm but later shedding out the granular spore-mass; spore-balls light chestnut-brown, oblong to chiefly subspherical or spherical, composed of many spores, firmly united (at least at first), chiefly 70–100 μ in length; spores subhyaline or yellowish-tinted, with free surface at least provided with a prominent deeper-colored verrucose epispore (sometimes even 3–6 μ thick), quite irregular, chiefly oblong to subspherical, 12–18 μ, or the most elongate-clavate forms even 27 μ, in length.

ON NYCTAGINACEAE:
Boerhaavia sp., Mexico.

TYPE LOCALITY: Chihuahua, Mexico, on *Boerhaavia* sp.

DISTRIBUTION: Known only from the type locality.

8. **Thecaphora Thornberi** Griff. Bull. Torrey Club **31**: 88. 1904.

Sori in ovaries, generally clustered in the inflorescence, subspherical, about 2–5 mm. in horizontal diameter which usually slightly exceeds the vertical, upon rupture disclosing reddish granular spore-mass; spore-balls light chestnut-brown, ovoid to spherical, rather regular, very firm (at least when young), composed of many spores, chiefly 80–125 μ in length; outer spores at least covered with an evident light chestnut-colored membrane or exospore which is somewhat papillate or wrinkled on exposed surface, but inner spores

smooth and apparently hyaline, very irregular, clavate to subspherical, 12–18 μ, or the most elongate forms even 30 μ, in length.

ON AMARANTHACEAE:
Cladothrix lanuginosa, Arizona.
TYPE LOCALITY: Santa Rita Mountains, four miles north of Helvetia, Arizona, on *Cladothrix lanuginosa*.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Bull. Torrey Club **31**: 85, *f. 9, 10.*

9. **Thecaphora aterrima** Tul. Ann. Sci. Nat. III. **7**: 110. 1847.

Sorosporium atrum Peck, Bot. Gaz. **5**: 35. 1880. (Type from Colorado, on *Carex pennsylvanica.*)
Tolyposporium aterrimum Dietel, in E. & P. Nat. Pfl. 1[1]**: 14. 1897.

Sori rather indefinite, at inner base of bracts of staminate spikes, hidden from view but on removal of bracts showing as black granular spore-masses, more rarely filling the perigynia (according to Peck); spore-balls usually black-brown, opaque, ovoid to spherical, firm, composed of 2–12 or rarely more spores, 17–35 μ, rarely 50 μ, in length; spores dark reddish-brown, triangular, semipolygonal or semicircular in cross-section, more or less obscurely papillate on free surface, chiefly 10–16 μ in length.

ON CYPERACEAE:
Carex adusta, Iowa.
Carex pennsylvanica, Colorado, Kansas.
Carex sp., Iowa.
TYPE LOCALITY: France, on *Carex praecox*.
DISTRIBUTION: Iowa, Kansas and Colorado; also in Europe and Africa.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 4, f. 20–22*; Mem. Acad. Sci. Bologna IV. **10**: 703.

9. **TOLYPOSPORELLA** Atk. Bull. Cornell Univ. 3[1]: 16. 1897.

Sori usually on the leaves, forming a black granular agglutinated coating; spore-balls variable, sometimes indefinite; spores dark-colored, provided with a very thick, often sac-like, epispore, usually of medium size; germination by a branched septate promycelium producing single lateral sporidia.

Type, *Tolyposporella Chrysopogonis* Atk.

Sori composed of definite spore-balls.	1. *T. Chrysopogonis.*
Sori composed of spores rather indefinitely agglutinated.	
Sori hidden on inner surface of leaf-sheaths.	2. *T. Brunkii.*
Sori on exposed surface of leaves.	3. *T. Nolinae.*

1. **Tolyposporella Chrysopogonis** Atk. Bull. Cornell Univ. 3[1]: 16. 1897.

Sori on inner surface of leaf-sheaths by which they are concealed, forming linear more or less merged striae of black granular-agglutinated spores; spore-balls black, opaque, more or less irregular, oblong to spherical, of many firmly agglutinated spores, 50–175 μ in length; spores dark-brown, chiefly subspherical or occasionally somewhat flattened, surrounded by a very prominently swollen and less deeply tinted sac-like envelope (of variable width and more or less sharply marked off from an inner dark thin layer), smooth, chiefly 9–12 μ in diameter exclusive of the envelope.

ON POACEAE:
Sorghastrum avenaceum (*Chrysopogon avenaceus*), Nebraska.
Sorghastrum nutans (*Chrysopogon nutans*), Alabama, Texas.
TYPE LOCALITY: Auburn, Alabama, on *Chrysopogon nutans* (*Sorghastrum nutans*).
DISTRIBUTION: Alabama and Texas.
EXSICCATI: Barth. Ellis & Ev. Fungi Columb. *1686, 2179.*

2. **Tolyposporella Brunkii** (Ellis & Gall.) Clinton, Jour. Myc. **8**: 147. 1902.

Ustilago (*Sorosporium?*) *Brunkii* Ellis & Gall. Jour. Myc. **6**: 31. 14 My 1890.
Ustilago apiculata Ellis & Gall.; Jennings, Tex. Agr. Exp. Sta. Bull. 9: 29. My 1890.

Sori on inner surface of leaf-sheaths though often showing through, forming short linear striae usually so thickly placed as to become merged into a coating of black granular spores; spores of different stages of development (the younger smaller and light-olive, the older often opaque and olive-black), more or less agglutinated but not in definite spore-balls, chiefly subspherical or spherical, obscurely granular with rather uniformly thickened epispore (2–4 μ) which often shows faint concentric layers (innermost often marked off as an apparent endospore), chiefly 10–19 μ in diameter.

ON POACEAE:
Andropogon argyraeus (*A. argenteus*), Texas.
Andropogon hirtiflorus pubiflorus, Mexico.
Andropogon perforatus, Mexico.
Andropogon saccharoides, Texas; Mexico.
Andropogon saccharoides leucopogon, Mexico.
TYPE LOCALITY: College Station, Texas, on *Andropogon argenteus*.
DISTRIBUTION: Texas and Mexico.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 127*; Sydow, Ust. *204*.

3. **Tolyposporella (?) Nolinae** Clinton, Proc. Bost. Soc. Nat. Hist. **31**: 426. 1904.

Sori on the leaves, usually so crowded as to form a continuous and very conspicuous stratum of agglutinated black granular spores over the greater part of their surface; spore-balls rather indefinite, often apparently of two, three, or four spores adhering in various ways and often separating into single spores; spores olive-black, oblong or ovoid to spherical, flattened where in contact, with thick smooth epispore, chiefly 11–18 μ in length.

ON DRACAENACEAE:
Nolina microcarpa, Arizona.
TYPE LOCALITY: Rincon Mountains, Arizona, on *Nolina microcarpa*.
DISTRIBUTION: Known only from the type locality.

10. **TOLYPOSPORIUM** Woronin, Abh. Senck. Nat. Ges. **12**: 577. 1882.

Sori usually in the inflorescence, more especially in the ovaries, forming a granular spore-mass at maturity; spore-balls dark-colored, composed of numerous spores permanently united, of medium size; spores bound together by ridged folds or thickenings of their outer walls, of small to medium size; germination about as in *Ustilago*.

Type, *Sorosporium Junci* Schröt.

Sori 2–5 mm. in length; spores polygonal or irregularly subspherical.
  Sori occupying only an occasional ovary. 1. *T. bullatum*.
  Sori usually occupying all of the ovaries. 2. *T. globuligerum*.
Sori 1–2 mm. in length; spores uniformly subspherical. 3. *T. Eriocauli*.

1. **Tolyposporium bullatum** Schröt. Krypt. Fl. Schles. **3**[1]: 276. 1887.

Sorosporium bullatum Schröt. Abh. Schles. Ges. Abth. Nat. Med. **1869–72**: 6. 1870.

Sori in ovaries, infecting occasional ones, ovate, about 3–5 mm. in length, covered with a thin greenish smooth membrane, upon rupture of which the black granular spore-mass becomes scattered; spore-balls black, opaque, oblong to spherical or polyhedral, usually containing 100 or more firmly agglutinated spores, chiefly 50–180 μ in length; spores semihyaline to light reddish-brown, covered with a thin tinted outer coat, more or less folded in ridges by which the spores are bound together and which on rupture of spore-balls often show as spiny projections at spore-margin, usually ovoid to subspherical or polyhedral, chiefly 7–10 μ, or rarely 12 μ, in length.

ON POACEAE:
Echinochloa Crus-galli (*Panicum Crus-galli*), Connecticut, Illinois, Iowa, Massachusetts, Nebraska, North Carolina.
TYPE LOCALITY: Silesia, on *Panicum Crus-galli* (*Echinochloa Crus-galli*).
DISTRIBUTION: New England to North Carolina and Nebraska; also in Europe.
ILLUSTRATIONS: Bot. Gaz. **19**: *pl. 18, f. 2–4*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 10, 40*; Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (8)*; Brefeld, Unters. Gesammt. Myk. **12**: *pl. 9, f. 25–30*; Flora **83**: *pl. 3, f. 13*.
EXSICCATI: Ellis, N. Am. Fungi *295*; Seym. & Earle, Econ. Fungi *C 53*.

2. **Tolyposporium globuligerum** (Berk. & Br.) Ricker, Jour. Myc. **11**: 112. 1905.

Thecaphora globuligera Berk. & Br. Trans. Linn. Soc. II. **1**: 407. 1879.
Testicularia Leersiae Cornu, Ann. Sci. Nat. VI. **15**: 275. 1883. (Type from Algeria, on *Leersia hexandra*.)
Ustilago Leersiae Dur.; Cornu, Ann. Sci. Nat. VI. **15**: 274, as a synonym. 1883.

Sori in ovaries, apparently infecting most of those in the inflorescence, more or less hidden by the enveloping glumes, oblong to occasionally subglobose, about 2 or 3 mm. in length, covered by a rather thick smooth membrane that upon rupture discloses the black granular spore-mass; spore-balls opaque, composed of many spores, variable, chiefly ovoid

to subspherical, 85–200 μ in length; spores tinted, with darker reddish-brown folds of outer coat showing as ridges or reticulations, or upon rupture as blunt processes or spine-like projections, chiefly irregularly polygonal or subglobose, 7.5–10 μ, rarely longer.

ON POACEAE:
Homalocenchrus hexandrus (*Leersia hexandra*), Alabama, Texas.
TYPE LOCALITY: Brisbane, Australia, on *Leersia hexandra* (*Homalocenchrus hexandrus*). (Type from Kew examined.)
DISTRIBUTION: Alabama and Texas; also in South America, Africa and Australia.
ILLUSTRATION: Ann. Sci. Nat. VI. 15: *pl. 14, f. 6–10.*

3. **Tolyposporium Eriocauli** Clinton, Rhodora 3: 82. 1901.

Sori in ovaries, ovoid, somewhat two-lobed, 1–2 mm. in length, very inconspicuous in the infected heads, covered by a grayish membrane which on rupture discloses the granular spore-mass; spore-balls black, perfectly opaque, irregularly oblong to subspherical, frequently somewhat angled, firm, composed of many spores, chiefly 65–200 μ in length; spores light-colored, subspherical to spherical, adhering together by dark folds of their outer membrane which on rupture of balls show as reticulations or spine-like processes or even become entirely detached, 8–11 μ in diameter exclusive of processes.

ON ERIOCAULACEAE:
Eriocaulon septangulare, Connecticut, Massachusetts, New Hampshire.
TYPE LOCALITY: Ellis, Massachusetts, on *Eriocaulon septangulare*.
DISTRIBUTION: New England.
ILLUSTRATION: Rhodora 3: 80, *f. 1.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 54.*

11. **TESTICULARIA** Klotzsch, Linnaea 7: 202. 1832.

Milleria Peck, Ann. Rep. N. Y. State Mus. 31: 40. 1879. Not *Milleria* L. 1753.

Sori in the inflorescence, possibly limited to the ovaries, forming a conspicuous agglutinated mass of spore-balls, provided with an evident false membrane; spore-balls composed of an external layer of fertile cells within which is a central mass of sterile parenchymatous cells, of large size; spores dark-colored, apparently at length dehiscing, of medium size; germination unknown.

Type, *Testicularia Cyperi* Klotzsch.

1. **Testicularia Cyperi** Klotzsch, Linnaea 7: 202. 1832.

Milleria herbatica Peck, Ann. Rep. N. Y. State Mus. 31: 40. 1879. (Type from New York, on *Rynchospora macrostachya*.)

Sori at the base of the spikelets of the inflorescence, apparently in the ovaries, one to several, forming conspicuous ovoid to subspherical tumors about 5–15 mm. in length, covered with a thick whitish false membrane that ruptures irregularly at apex and discloses a usually firmly agglutinated black granular mass of spore-balls; sterile cells of false membrane hyaline, chiefly subspherical, rather firmly bound together, about 11–17 μ in diameter, often semigelatinized; spore-balls black, chiefly ovoid to subspherical, composed of a superficial layer of numerous spores and an internal mass of thin-walled semihyaline or brownish sterile cells averaging slightly smaller than the spores, 160–375 μ in length; spores with very thick opaque wall having lighter-colored reddish-brown central part, chiefly ovoid to spherical, smooth or slightly granular, 13–16 μ in length.

ON CYPERACEAE:
Rynchospora corniculata macrostachya (*R. macrostachya*), New York.
TYPE LOCALITY: North America, on *Cyperaceae*.
DISTRIBUTION: Wading River, New York.
ILLUSTRATIONS: Ann. Sci. Nat. VI. 15: *pl. 14, f. 1–5;* Linnaea 7: *pl. 9, A.*
EXSICCATI: Ellis, N. Am. Fungi *805.*

Family 2. TILLETIACEAE

By George Perkins Clinton

Sori either forming dusty erumpent spore-masses or else permanently imbedded in the tissues. Germination by means of a short promycelium which usually gives rise to a terminal cluster of elongate sporidia that, with or without fusing in pairs, produce similar or dissimilar secondary sporidia or germinate directly into infection-threads.

Spores single.
  Sori dusty at maturity.
    Spores without a conspicuous hyaline appendage. — 1. Tilletia.
    Spores with an elongate hyaline appendage. — 2. Neovossia.
  Sori permanently imbedded in the tissues. — 5. Entyloma.
Spores in balls.
  Sori dusty; spore-balls with sterile cortex. — 4. Urocystis.
  Sori rather permanently embedded in tissues.
    Spore-balls without sterile cortex.
      Spore-balls consisting entirely of dark-colored spores. — 3. Tuburcinia.
      Spore-balls consisting of light-colored spores.
        Spore-balls with or without central sterile cells. — 6. Burrillia.
        Spore-balls with central network of filaments. — 8. Tracya.
    Spore-balls with sterile cortex. — 7. Doassansia.

1. TILLETIA Tul. Ann. Sci. Nat. III. 7: 112. 1847.

Sori in various parts of the hosts, usually in the ovaries, forming a dusty spore-mass; spores single, usually formed singly in the ends of the mycelial threads that disappear more or less completely through gelatinization, of medium to large size; germination usually by a short promycelium which bears a terminal cluster of elongate sporidia that with or without fusing in pairs may, in nutrient solutions, give rise to a considerable mycelium bearing secondary air-sporidia.

Type, *Uredo Caries* DC.

Spores smooth. — 1. *T. foetens.*
Spores reticulate.
  Sori 5–8 mm. in length.
    Spores 16–22 μ in length. — 2. *T. Trilici.*
    Spores 23–28 μ in length. — 3. *T. Elymi.*
  Sori 3–5 mm. in length.
    Sterile cells chiefly thin-walled; smaller than spores.
      Spores 28–34 μ in length. — 5. *T. Muhlenbergiae.*
      Spores chiefly 25–30 μ in length. — 4. *T. Anthoxanthi.*
      Spores chiefly 20–25 μ in length. — 8. *T. fusca.*
    Sterile cells with very thick walls (3–6 μ); larger than spores. — 10. *T. Redfieldiae.*
  Sori 1 or 2 mm. in length.
    Sterile cells chiefly thin-walled; smaller than spores.
      Spores chiefly 25–30 μ in length.
        Reticulations chiefly cerebriform. — 6. *T. cerebrina.*
        Reticulations polygonal. — 7. *T. Airae.*
      Spores 17–25 μ in length. — 9. *T. montana.*
    Sterile cells very thick-walled (3–8 μ); larger than spores. — 11. *T. asperifolia.*
Spores apparently verruculose. — 12. *T. Maclagani.*
Spores with prominent tubercles, spines or scales.
  Sori in the culms. — 13. *T. Earlei.*
  Sori in the ovaries.
    Spores chiefly 18–25 μ in length.
      Spores without pedicel-like projection of hyaline envelope.
        Spores with prominent tubercles.
          Sori 3–5 mm. in length. — 14. *T. texana.*
          Sori about 1 or 2 mm. in length.
            Mature spores? but slightly tinted. — 15. *T. Wilcoxiana.*
            Mature spores chocolate-brown.
              Host: *Bulbilis* (*Buchloe*). — 16. *T. buchloeana.*
              Host: *Cathestecum*. — 17. *T. Cathesteci.*
        Spores with coarse scale-like appendages. — 19. *T. rugispora.*
      Spores with pedicel-like projection of hyaline envelope. — 18. *T. corona.*

Spores 25–35 μ, occasionally smaller; with coarse scales.
Sori about 3–4 mm. in length.
Completely destroying the seed. 20. *T. pulcherrima.*
Incompletely destroying the seed. 21. *T. horrida.*
Sori 1 mm. or less in length. 22. *T. Eragrostidis.*

1. **Tilletia foetens** (B. & C.) Trel. Par. Fungi Wisc. 35. 1884.

Ustilago foetens B. & C. (Rav. Fungi Car. V. *100;* hyponym. 1860) Grevillea **3**: 59. 1874.
Tilletia laevis Kühn; Rab. Fungi Eur. *1697.* 1873.

Sori in ovaries, ovate or oblong, 5–8 mm. in length, more or less concealed by the glumes, all or only part of the ovaries of a spike infected; spores light- to dark-brown, oblong to chiefly subspherical or spherical, occasionally somewhat angular, foetid especially when young, smooth, chiefly 16–22 μ, the most elongate rarely 28 μ, in length.

ON POACEAE:
Triticum vulgare, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Jersey, North Carolina, North Dakota, Ohio, South Dakota, Wisconsin, Wyoming; Manitoba, Northwest Territory.
TYPE LOCALITY: North Carolina, on *Triticum vulgare.*
DISTRIBUTION: Coextensive with the cultivation of wheat.
ILLUSTRATIONS: Bull. N. Dak. Agr. Exp. Sta. *27*: *f. 2–11;* Bull. Ill. Agr. Exp. Sta. 57: *pl. F4, R6, T4;* Bull. Kan. Agr. Exp. Sta. 8: *pl. 4;* Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (5);* Ann. Rep. Mass. State Agr. Exp. Sta. **9**: 248, *pl. 1, f. 6.*
EXSICCATI: Seym. & Earle, Econ. Fungi *79, C50, C51;* Griff. West Am. Fungi *28, 28ª, 28ᵇ;* Ellis, N. Am. Fungi *1497, 3236;* Ellis & Ev. Fungi Columb. *647;* Rav. Fungi Car. V. *100.*

2. **Tilletia Tritici** (Bjerk.) Wint.; Rab. Krypt. Fl. **1**[1]: 110. 1881.

Lycoperdon Tritici Bjerk. K. Sv. Vet.-Acad. Handl. **36**: 326. 1775.
Uredo Caries DC. Fl. Fr. **6**: 78. 1815. (Type from France, on *Triticum vulgare.*)
Tilletia Caries Tul. Ann. Sci. Nat. III. **7**: 113. 1847.

Sori in ovaries, ovate to oblong, 5–8 mm. in length, more or less concealed by the glumes; sterile cells few, hyaline, subspherical, with medium thin wall, smaller than spores; spores chiefly subspherical or spherical, light- to dark-brown, with winged reticulations about 1 μ high by 2–4 μ wide, 16–22 μ in diameter.

ON POACEAE:
Triticum vulgare, Arizona, Iowa, Kansas, Michigan, Minnesota, Montana, Nevada, New Jersey, New York, Ohio, Oregon, Washington, West Virginia.
TYPE LOCALITY: Sweden, on *Triticum hybernum* (*T. vulgare*).
DISTRIBUTION: Locally distributed wherever wheat is cultivated.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 5, f. 1–16; ibid.* IV. **2**: *pl. 12, f. 1–26;* Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (1);* Brefeld, Unters. Gesammt. Myk. **5**: *pl. 12, f. 25–34, pl. 13;* Tubeuf, Diseases Pl. *f. 166, 167;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 22;* Jahrb. Wiss. Bot. **7**: *pl. 9, f. 1–5;* Plowright, Brit. Ured. Ust. *pl. 6, f. 7–13.*

3. **Tilletia Elymi** Dietel & Holway, Bot. Gaz. **19**: 305. 1894.

Sori in ovaries, oblong, about 5 or 6 mm. in length, showing between the glumes, upon rupture disclosing dark reddish-brown dusty spore-mass; spores foetid, showing different stages of development, with youngest as hyaline cells smaller than the mature spores which are chestnut-brown, chiefly subspherical or spherical, provided with evident often regular polygonal reticulations (in some varying to irregularly elongate or somewhat cerebriform), which show at circumference as more or less evident winged projections 1–3 μ in height, 23–28 μ in diameter.

ON POACEAE:
Elymus glaucus, Montana.
Elymus sp., Washington.
TYPE LOCALITY: Skamania County, Washington, on *Elymus* sp.
DISTRIBUTION: Montana and Washington.
EXSICCATI: Griff. West Am. Fungi *203;* Ellis & Ev. Fungi Columb. *1486.*

4. **Tilletia Anthoxanthi** Blytt, Forh. Vid.-Selsk. Christ. **1896**[6]: 31. 1896.

Sori in ovaries, chiefly ovate, about 3 mm. in length, usually infecting all of the flowers of the spike and showing somewhat between the glumes, upon rupture disclosing dusty reddish-black spore-mass; sterile hyaline cells chiefly smaller than the spores, with thin to medium thick walls; spores reddish-brown, ovoid to spherical, with usually rather

regular reticulations (3–6 μ wide, projecting as winged margin 1–3 μ), 24–30 μ, or occasionally even 34 μ, in length.

ON POACEAE:
Anthoxanthum odoratum, Connecticut.
TYPE LOCALITY: Norway, on *Anthoxanthum odoratum*.
DISTRIBUTION: Connecticut; also in Europe.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 12, 39.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 124.*

5. **Tilletia Muhlenbergiae** Clinton, sp. nov.

Sori in ovaries, apparently occupying all in the inflorescence, ellipsoidal, about 3 mm. in length, somewhat hidden by the glumes, with a greenish membrane of plant tissue at apex of which are the evident remains of the styles, easily rupturing and disclosing dusty black-brown spore-mass; sterile cells hyaline, subspherical or spherical, thin- to medium thick-walled, smaller than the spores; spores reddish to dark reddish-brown, chiefly subspherical or spherical, with very prominent polygonal winged reticulations (4–8 μ wide by about 3 μ deep), 28–34 μ in diameter.

ON POACEAE:
Muhlenbergia Schaffneri elongata, Mexico.
Type collected in northeastern Durango, Mexico, October, 1905, by C. G. Pringle, and communicated by E. W. D. Holway. The winged reticulations of the spores are the most prominent of any of the species reported here.

6. **Tilletia cerebrina** Ellis & Ev. Jour. Myc. **3**: 56. 1887.

Sori in ovaries, ovoid, 1–2 mm. in length, showing somewhat through the glumes; sterile cells hyaline, smaller than the spores, with medium thick walls; spores rather dark reddish-brown, chiefly ovoid to spherical, with prominent polygonal or irregularly elongate or even cerebriform reticulations often ending in free ridges and at circumference showing as projections (1–2.5 μ, extending out to enveloping membrane), chiefly 24–30 μ in length.

ON POACEAE:
Deschampsia caespitosa, Rocky Mountains.
TYPE LOCALITY: Rocky Mountain region, on *Deschampsia caespitosa*.
DISTRIBUTION: Rocky Mountains.

7. **Tilletia Airae** Blytt, Forh. Vid.-Selsk. Christ. **1896**[6]: 31. 1896.

Sori and spores same as in *Tilletia cerebrina*, except reticulations of spores regular instead of cerebriform.

ON POACEAE:
Deschampsia calycina, Oregon, Washington.
TYPE LOCALITY: Norway, on *Aira caespitosa* (*Deschampsia caespitosa*).
DISTRIBUTION: Oregon and Washington; also in Europe.

8. **Tilletia fusca** Ellis & Ev. Jour. Myc. **3**: 55. 1887.

Sori in ovaries, oblong, 3–5 mm. long, usually showing plainly between the glumes; sterile cells hyaline, ovoid to spherical, comparatively thin-walled, small, about 14–20 μ in length; spores medium-dark reddish-brown, chiefly ovoid to spherical, occasionally slightly angled, with prominent chiefly regular reticulations (1–4 μ wide) showing at circumference as short blunt projections (about 1 μ high) so that the enveloping membrane usually closely invests the spore, chiefly 20–25 μ in length.

ON POACEAE:
Festuca microstachya, Washington.
Festuca octoflora (*F. tenella*), Idaho, Montana, Oregon, Washington, Wyoming.
TYPE LOCALITY: Rocky Mountain region, on *Festuca microstachya*.
DISTRIBUTION: Montana and Wyoming to Oregon and Washington.
EXSICCATI: Griff. West Am. Fungi *202*, *202a*; Seym. & Earle, Econ. Fungi *C 125.*

9. **Tilletia montana** Ellis & Ev. Jour. Myc. **3**: 55. 1887.

Sori in ovaries, ovoid, about 1 mm. long, showing somewhat between and also slightly through the enveloping glumes; sterile cells hyaline, usually smaller than the spores, not very numerous, with thick wall; spores reddish-brown, ovoid to spherical, with evident hyaline enveloping membrane about 2–3 μ from spore having a papilla or thread of detach-

ment at one side, with reticulations of wall somewhat irregular forming polygonal or sometimes more elongate areas and occasionally with free ridges projecting into these, with the reticulations showing at circumference as straight projecting spines, 17–25 μ in length.

ON POACEAE:
Sporobolus gracillimus, Rocky Mountains.
Sporobolus simplex, Montana.
TYPE LOCALITY: Rocky Mountain region, on *Sporobolus gracillimus*.
DISTRIBUTION: Montana.
EXSICCATI: Griff. West Am. Fungi *226*.

10. **Tilletia Redfieldiae** Clinton, sp. nov.

Sori in ovaries, apparently infecting all of the spikelets, elliptical, showing prominently between the glumes, about 4–5 mm. in length; sterile cells hyaline, ovoid to subspherical but often somewhat polyhedral or irregular, with thick walls (3–6 μ), larger than spores, sometimes even 42 μ in length; spores reddish-brown, ovoid to spherical or occasionally more elongate or angular, with rather regular polygonal reticulations that are 2.5–5 μ wide and 2–3 μ deep, chiefly 18–22 μ, or occasionally 25 μ, in length.

ON POACEAE:
Redfieldia flexuosa, Nebraska.
Type collected in Hooker County, Nebraska, on *Redfieldia flexuosa*, by P. A. Rydberg, July 19, 1895.
This species was originally reported as *Tilletia montana*. It is very closely related to *Tilletia asperifolia*, having the large thick-walled sterile cells of that species. It differs in having a larger sorus and apparently in the reticulations of the spores being larger and extending further out at the margin, and in the sterile cells possibly being somewhat thinner-walled. The writer is indebted for a specimen of this species to Professor Bessey.

11. **Tilletia asperifolia** Ellis & Ev. Jour. Myc. **3**: 55. 1887.

Sori in ovaries, ovoid, about 1 mm. in length, showing somewhat through and between the hyaline enveloping glumes, usually occurring in all the spikelets; sterile cells hyaline, chiefly ovoid to subspherical, with very thick (occasionally even 8 μ) indistinctly laminate walls and central oil or granular contents, large, usually 25–38 μ in length; spores reddish-brown, chiefly ovoid to spherical, occasionally more elongate or somewhat angular, with rather regular polygonal reticulations that are about 2–3 μ wide extending out at the circumference about 1 μ so that the enveloping membrane is rather closely applied, chiefly 17–22 μ, rarely 25 μ, in length.

ON POACEAE:
Sporobolus asperifolius, Arizona, Colorado, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.
TYPE LOCALITY: Rocky Mountain region, on *Sporobolus asperifolius*.
DISTRIBUTION: Montana to New Mexico, Arizona, and Washington.

12. **Tilletia Maclagani** (Berk.) Clinton, Jour. Myc. **8**: 148. 1902.

Ustilago Maclagani Berk. Grevillea **3**: 58. 1874.
Ustilago rotundata Arth. Bull. Iowa Agr. Coll. Dep. Bot. **1884**: 173. 1884. (Type from Iowa, on *Panicum virgatum*).
Tilletia rotundata Massee, Kew Bull. **1899**: 145. 1899.

Sori in ovaries and occasionally in anthers, inconspicuous, concealed by the enveloping glumes, upon rupture shedding out a dusty red-brown spore-mass; spores showing different stages of development, the older light to dark reddish-brown, chiefly subspherical or spherical though occasionally more elongate or somewhat irregular, with a thick wall (3–4 μ) apparently closely covered with verruculations (really very minutely areolately pitted), 18–27 μ in length.

ON POACEAE:
Panicum virgatum, Connecticut, Iowa, Kansas, Nebraska; Quebec.
TYPE LOCALITY: Montreal, Canada, on *Panicum virgatum*.
DISTRIBUTION: Quebec, Connecticut, Iowa, Kansas and Nebraska.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 11*.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 126*; Ellis & Ev. N. Am. Fungi *1894*.

13. **Tilletia Earlei** Griff. Bull. Torrey Club **29**: 290. 1902.

Sori in culms usually affecting next to upper internode, forming a somewhat swollen body 1–10 cm. in length, rupturing by longitudinal fissures which disclose a semi-dusty light-

brown spore-mass; sterile cells smaller than spores, often with thick smooth wall; spores slightly tinted to light golden-brown, chiefly subspherical or spherical, occasionally ovoid, with coarse bluntish tubercles extending out about 2 μ to the evident hyaline envelope, chiefly 18–22 μ in diameter.

ON POACEAE:
Agropyron occidentale, South Dakota.
TYPE LOCALITY: Aberdeen, South Dakota, on *Agropyron occidentale*.
DISTRIBUTION: Known only from its type locality.
ILLUSTRATION: Bull. Torrey Club **29**: 291, *f. 2*.
EXSICCATI: Griff. West Am. Fungi *311*.

14. **Tilletia texana** Long; Clinton, Jour. Myc. **8**: 149. 1902.

Sori in ovaries, ovoid or oblong, about 3–5 mm. in length, often more or less hidden by enveloping glumes, forming a somewhat agglutinated light reddish-brown spore-mass; sterile cells not very numerous, hyaline, with very thick often lamellate walls and central contents; spores very light-colored, orange-yellow (appearing as if somewhat immature), chiefly subspherical or spherical, with prominent conical tubercles (blunt or sometimes quite pointed) which extend out 2–3 μ to the evident hyaline envelope, chiefly 19–25 μ in diameter (including envelope).

ON POACEAE:
Hordeum nodosum (*H. pratense*), Texas.
TYPE LOCALITY: Austin, Texas, on *Hordeum pratense* (*H. nodosum*).
DISTRIBUTION: Known only from the type locality.

15. **Tilletia Wilcoxiana** Griff. Bull. Torrey Club **31**: 88. 1904.

Sori in ovaries, usually showing through the basal parts of the glumes, about 1.5–2.5 mm. in length, ovoid to ellipsoidal, frequently somewhat flattened, covered by plant membrane that usually bears the styles at its apex, upon rupture disclosing a reddish-brown spore-mass; spores slightly tinted (appearing as if immature), with evident hyaline enveloping membrane, subspherical to spherical, thick-walled with tubercles showing prominently at margin, 18–22 μ in diameter.

ON POACEAE:
Stipa eminens Andersoni, California.
TYPE LOCALITY: Santa Monica, California, on *Stipa eminens Andersoni*.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Bull. Torrey Club **31**: 85, *f. 17*.

16. **Tilletia buchloeana** Kellerm. & Swingle, Jour. Myc. **5**: 11. 1889.

Sori in ovaries, ovoid, 1–2 mm. in length, showing between or often concealed by enveloping glumes, with dark reddish-brown spore-mass; sterile cells hyaline, subspherical, with very thick lamellate wall and comparatively small central contents, somewhat more variable in size than the spores; spores light chocolate-brown, chiefly subspherical or spherical, with prominent short blunt tubercles often reaching only half way to outer margin of the prominent hyaline membrane which forms a band usually 2–4 μ wide and shows papilla of attachment, 17–22 μ in length.

ON POACEAE:
Bulbilis dactyloides (*Buchloe dactyloides*), Kansas.
TYPE LOCALITY: Trego County, Kansas, on *Buchloe dactyloides* (*Bulbilis dactyloides*), staminate plants.
DISTRIBUTION: Kansas.
ILLUSTRATION: Jour. Myc. **5**: *pl. 1, f. 1–11*.

17. **Tilletia Cathesteci** (P. Henn.) Clinton, Jour. Myc. **8**: 149. 1902.

Ustilago Cathesteci P. Henn. Hedwigia **36**: 212. 1897.

Sori in ovaries, ovoid, about 1 mm. in length, often inconspicuous and with styles still attached, more or less concealed by the glumes, with black-brown spore-mass; sterile cells hyaline, with very thick wall, less common than the stages of immature spores; mature spores chocolate-brown, chiefly subspherical or spherical, with prominent conical tubercles (becoming blunt and less conspicuous with maturity) which extend out half way or more to the very evident hyaline membrane, chiefly 19–24 μ (exclusive of envelope) in diameter.

ON POACEAE:
Cathestecum prostratum, Mexico.
TYPE LOCALITY: Mexico, on "*Cathestecum procumbens*" (*C. prostratum*).
DISTRIBUTION: Mexico.

18. **Tilletia corona** Scrib.; Tracy & Earle, Bull. Torrey Club 23: 210. 1896.

Neovossia corona Massee, Kew Bull. 1899: 156. 1899.

Sori in ovaries, ovoid or ovate, about 3–4 mm. in length, more or less exposed between the glumes; spores showing different stages of development, when mature opaque, chiefly subspherical or spherical, with evident hyaline membrane ending at one side in a short pedicel-like projection, with evident sometimes slightly curved hyaline spines (on top of spore showing as papillae) extending out to membrane and with it forming a hyaline band 1–2 μ deep, chiefly 19–25 μ in diameter.

ON POACEAE:
Homalocenchrus lenticularis (*Leersia lenticularis*), Mississippi.
Homalocenchrus oryzoides (*Leersia oryzoides*), District of Columbia, Missouri.
Homalocenchrus virginicus (*Leersia virginica*), District of Columbia, Illinois, Mississippi, Ohio.
TYPE LOCALITY: Washington, District of Columbia, on *Homalocenchrus oryzoides*.
DISTRIBUTION: District of Columbia to Missouri and Mississippi.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1896*.

19. **Tilletia rugispora** Ellis, Jour. Myc. 7: 275. 1893.

Sori in ovaries, subspherical, inconspicuous, about 2 mm. in diameter, concealed by the glumes; sterile cells hyaline or often tinted, more or less irregular, polygonal to subspherical, thick-walled, varying from smaller to larger than the spores; mature spores dark reddish-brown, ovoid to spherical, with rather prominent tinted appendages that show at circumference as blunt scales (1–2 μ) and on top in cross-section (1–2.5 μ) as more or less irregular polygonal areas, 18–25 μ in length.

ON POACEAE:
Paspalum plicatulum, Texas.
Paspalum sp., Mexico.
TYPE LOCALITY: College Station, Texas, on *Paspalum plicatulum*.
DISTRIBUTION: Texas and Mexico.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2704*.

20. **Tilletia pulcherrima** Ellis & Gall.; Clinton, Proc. Bost. Soc. Nat. Hist. 31: 441. 1904.

Sori in ovaries, ovate or more elongate and somewhat curved, extending between the spreading glumes, about 3–4 mm. in length; hyaline sterile cells medium to very thick-walled, chiefly smaller than the spores; spores showing different stages of development, the mature spores being opaque, subspherical to spherical, with more or less evident hyaline membrane and conspicuous hyaline or opaque acute or truncate scale-like projections 2 μ long (in cross-section on top of spores showing as polygonal areas), chiefly 20–30 μ in diameter.

ON POACEAE:
Panicum obtusum, Arizona.
Panicum virgatum, Illinois, Nebraska.
Syntherisma sanguinale (*Panicum sanguinale*), Mississippi.
TYPE LOCALITY: Oregon, Illinois, on *Panicum virgatum*.
DISTRIBUTION: Illinois, Mississippi, Nebraska, and Arizona.
ILLUSTRATION: Bull. Torrey Club 31: 85, *f. 5, 6*.
EXSICCATI: Seym. & Earle, Econ. Fungi *543, C 52*.

21. **Tilletia horrida** Tak. Bot. Mag. Tokyo 10: 20. 1896.

Sori in ovaries more or less destroying them, completely concealed by enveloping glumes; spores showing different stages of development, with youngest as thick-walled, hyaline cells, mature spores rather opaque, chiefly subspherical to spherical, with very coarse hyaline or slightly tinted somewhat curved scales showing at circumference of spore as a band about 2–4 μ wide and on its top in cross-section as polygonal areas 2–3 μ across, with hya-

line membrane more or less evident and often ending at one side in a short thread-like projection, 22–33 μ in length.

ON POACEAE:
Oryza sativa, South Carolina.
TYPE LOCALITY: Tokyo, Japan, on *Oryza sativa*.
DISTRIBUTION: South Carolina; also in Asia where rice is cultivated.
ILLUSTRATIONS: Bot. Mag. Tokyo **10**: 20; Bull. S. Car. Agr. Exp. Sta. 41: *f. 1–4;* Bot. Gaz. **27**: 468, *f. 1–4*.

22. **Tilletia Eragrostidis** Clinton & Ricker; Ricker, Jour. Myc. **11**: 111. 1905.

Sori in ovaries infecting one here and there in the inflorescence, ovoid, about 1 mm. or less in length; sterile cells hyaline, ovoid to spherical, with thick lamellate walls, chiefly smaller than the spores; spores light to dark reddish-brown, often opaque, subspherical or spherical, rarely more elongate, with coarse tinted truncate scales extending out at circumference 2.5–4 μ and showing on top in cross-section as polygonal areas, 28–37 μ in length.

ON POACEAE:
Eragrostis glomerata, Mississippi.
TYPE LOCALITY: Yazoo City, Mississippi, on *Eragrostis glomerata*.
DISTRIBUTION: Known only from the type locality.

DOUBTFUL AND EXCLUDED SPECIES

Tilletia Oryzae Pat. Bull. Soc. Myc. Fr. **3**: 124. 1887. = *Ustilaginoidea Oryzae* (Pat.) Bref., an ascomycete.

? *Tilletia* sp., resembling *Tilletia Sphagni*. On *Ricciocarpus natans*. Nature undetermined.

2. NEOVOSSIA Körn. Oesterr. Bot. Zeits. **29**: 217. 1879.

Vossia Thüm. Oesterr. Bot. Zeits. **29**: 18. 1879. Not *Vossia* Wallich & Griffith. 1836.

Sori usually in ovaries, forming a somewhat dusty spore-mass; spores simple, produced singly in the swollen ends of special fertile threads (sterigmata of Magnus) which permanently invest the spores and taper into elongate hyaline appendages, of large size; germination by a short promycelium producing numerous terminally clustered linear sporidia which germinate without conjugation and, in nutrient solutions, give rise to a mycelium producing secondary sporidia of two kinds.

Type, *Vossia Moliniae* Thüm.

1. **Neovossia iowensis** Hume & Hodson, Bot. Gaz. **30**: 274. 1900.

Sori in ovaries, ovoid, about 2–3 mm. in length, showing between the spreading glumes, upon rupture of covering membrane disclosing a dusty black spore-mass; sterile cells or immature spores hyaline, thick-walled, chiefly smaller than the spores; spores reddish-brown, subopaque, ovoid or ellipsoidal to rarely subspherical, with prominent hyaline envelope that terminates at one end in a tapering irregular tail about twice the length of the spore, the cell-wall minutely reticulate-pitted, 19–28 μ × 13–19 μ.

ON POACEAE:
Phragmites Phragmites (*P. communis*), Connecticut, Iowa.
TYPE LOCALITY: Colo, Iowa, on *Phragmites communis* (*P. Phragmites*).
DISTRIBUTION: Connecticut and Iowa.
ILLUSTRATIONS: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 13;* Bull. Iowa Agr. Exp. Sta. 54: *f. 122;* Bot. Gaz. **30**: 274, *f. 1*.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 113*.

3. TUBURCINIA [Fries] Woronin, Abh. Senck. Nat. Ges. **12**: 561. 1882.

Sori usually in the leaves or stem, forming dark-colored often papillate areas, rather permanently embedded in the tissues; spore-balls composed entirely of firmly united fertile cells, of medium size; spores usually dark-colored, variable, of medium size; sometimes preceded by conidia, forming a conspicuous white growth on the surface of leaves, hyaline, oblong to ovate.

Type, *Tuburcinia Trientalis* B. & Br.

Spore-balls of 6 to many spores; 27–75 μ in length. 1. *T. Clintoniae*.
Spore-balls of 10 to many spores; 45–100 μ in length. 2. *T. Trientalis*.

1. **Tuburcinia Clintoniae** Kom.; Jacz.-Kom.-Tranz. Fungi Rossiae *260*. 1899.

Sori in leaves, oval to subcircular, about 2–5 mm. in length, forming flat minutely granular agglutinated black areas showing on both sides, permanently covered by the epidermis; spore-balls dark reddish-brown, ovoid to spherical, often surrounded by an inconspicuous covering of sterile threads, firm, of 6 to many spores, 27–75 μ in length; spores reddish-brown, variable, somewhat oblong or cuneate to chiefly polygonal in cross-section, smooth, 12–18 μ in length; conidial stage unknown.

ON CONVALLARIACEAE:
Streptopus roseus, British Columbia.
Vagnera stellata (*Smilacina stellata*), Wisconsin.
TYPE LOCALITY: Siberia, on *Clintonia udensis*.
DISTRIBUTION: Wisconsin and British Columbia; also in Europe.
EXSICCATI: Ellis, Ev. & Barth. Fungi Columb. *1789*; Seym. & Earle, Econ. Fungi *C 128*.

2. **Tuburcinia Trientalis** B. & Br. Ann. Mag. Nat. Hist. II. 5: 464. 1850.

Ascomyces Trientalis Berk. Outl. Brit. Fungi 376. 1860. [Conidial stage.]
Sorosporium Trientalis Woronin; Fisch. de Waldh. Aperçu Syst. Ust. 32. 1877.

Sori on leaves, petioles and stems, variable, often pustular, on stems frequently forming areas of considerable extent, sometimes erumpent; spore-balls reddish-brown, irregular, oblong to subspherical, firm, usually with little evidence of sterile envelope, composed of 10 to many spores, 45–100 μ in length; spores reddish-brown, oblong to polyhedral, smooth, 14–22 μ in length; conidial stage forming a dense, white, epiphyllous coating usually over entire leaf, with hyaline, thin-walled, oblong to ovate conidia about 11–14 μ × 5–7 μ.

ON PRIMULACEAE:
Trientalis arctica (*T. europaea*), Alaska.
TYPE LOCALITY: Aberdeen, Scotland, on *Trientalis europaea*.
DISTRIBUTION: Alaska; also in Europe.
ILLUSTRATION: Abh. Senck. Nat. Ges. 12: 559.

4. **UROCYSTIS** Rab.; Klotzsch, Herb. Viv. Myc. ed. 2. *393*. 1856.

Polycystis Lév. Ann. Sci. Nat. III. 5: 269. My 1846. Not *Polycystis* Kütz. Ja 1846.

Sori usually in the leaves or stems, occasionally in other parts, producing dark-colored usually dusty spore-masses; spore-balls permanent, composed of an enveloping cortex of tinted sterile cells and usually one to several interior fertile cells, of small to medium size; spores generally dark-colored, variable, of medium size; germination by a short promycelium producing terminally grouped sporidia which give rise to similar secondary sporidia or to infection-threads.

Type, *Erysibe occulta* Wallr.

Sori in leaves, petioles or stems.
  Spore-balls without a true cortex. — 1. *U. Waldsteiniae.*
  Spore-balls with a true cortex.
    Spores usually 1–5 in the balls.
      Cortical cells incompletely covering spores. — 2. *U. Anemones.*
      Cortical cells rather completely covering spores. — 3. *U. carcinodes.*
    Spores usually 4–8 in the balls.
      Cortical cells 8–15 μ; spore-balls 30–60 μ, rarely 90 μ. — 4. *U. sorosporioides.*
      Cortical cells 6–10 μ; spore-balls chiefly 28–55 μ. — 5. *U. Violae.*
    Spores usually 1, rarely 2, in the balls.
      Cortical cells 6–10 μ, rarely 12 μ. — 6. *U. Lithophragmae.*
      Cortical cells usually 4–8 μ. — 7. *U. Cepulae.*
    Spores usually 1 or 2, rarely 3 or 4, in the balls.
      Sori in areas or pustules. — 8. *U. Colchici.*
      Sori in striae.
        Cortical cells incompletely covering spores. — 9. *U. occulta.*
        Cortical cells completely covering spores. — 10. *U. Agropyri.*
Sori in the culm filling the interior. — 11. *U. Junci.*
Sori in the inflorescence.
  Sori in the spikelets. — 12. *U. granulosa.*
  Sori in the flowers and pedicels. — 13. *U. Hypoxyis.*

1. **Urocystis Waldsteiniae** Peck, Ann. Rep. N. Y. State Mus. 46 : 112. 1893.

Ustilago Waldsteiniae Paz.; Rab.-Wint.-Paz. Fungi Eur. *4011.* 1895.
Urocystis Gei Ellis & Ev. Bull. Torrey Club **27** : 572. 1900. (Type from Washington, on *Geum ciliatum*.)

Sori on leaves, epiphyllous, oval to linear, forming pustules that follow the veins and are covered at first by a false indusium that dehisces through the center and spreads back on either side disclosing the olive-black dusty spore-mass; sterile cells apparently lacking; spores simple or often adhering rather temporarily together in pairs or groups of 3 or 4, reddish-brown, rather irregular, oblong to polyhedral or often subspherical, smooth, 9–14 μ, occasionally 16 μ, in length.

ON ROSACEAE :
Sieversia ciliata (*Geum ciliatum*), Washington.
Waldsteinia fragarioides, New York, Wisconsin; Canada.
TYPE LOCALITY : Alcove, New York, on *Waldsteinia fragarioides*.
DISTRIBUTION : Canada, New York, Wisconsin, and Washington.
EXSICCATI : Ellis & Ev. Fungi Columb. *137, 1595;* Shear, N. Y. Fungi *86;* Ellis & Ev. N. Am. Fungi *2983;* Sydow, Ust. *248;* Seym. & Earle, Econ. Fungi *C 62;* Rab.-Wint.-Paz. Fungi Eur. *4011.*

The generic position of this species is unsettled, but it is placed here until further study determines its place.

2. **Urocystis Anemones** (Pers.) Wint.; Rab. Krypt. Fl. **1**[1] : 123. 1881.

Uredo Anemones Pers. Tent. Disp. Fung. 56. 1797.
Caeoma pompholygodes Schlecht. Linnaea 1 : 248. 1826.
Urocystis pompholygodes Rab. Fungi Eur. *697.* 1864.

Sori in leaves, petioles, and stems, forming conspicuous pustules of varying shape and size, upon rupture disclosing a dusty brown-black spore-mass; spore-balls irregular, apparently separating somewhat into the sterile cells and spores, usually 22–35 μ, rarely 45 μ, in length; sterile cells usually incompletely covering the spores, often only on one side, smoky-brown or yellowish-tinted, ovoid to spherical, usually thin-walled, about 8–14 μ in length; spores reddish-brown, irregular, oblong or ovoid to polyhedral or subspherical, smooth, 1–5 though usually only 1 or 2 in a ball, chiefly 12–17 μ, the most elongate rarely 20 μ, in length.

ON RANUNCULACEAE :
Anemone canadensis (*A. pennsylvanica*), New York, Wisconsin.
Anemone caroliniana, Kansas, Texas.
Anemone decapetala, Kansas, Texas.
Anemone quinquefolia (*A. nemorosa*), Connecticut, Iowa, Maine, Massachusetts, Michigan, New York, Wisconsin.
Anemone virginiana, Iowa, New York, Texas.
Cyrtorhyncha ranunculina, Wyoming.
Hepatica acuta (*H. acutiloba*), Illinois, Indiana, Iowa, Minnesota, New York, Wisconsin.
Hepatica Hepatica (*H. triloba*), Missouri.
Pulsatilla hirsutissima (*Anemone patens Nuttalliana*), Colorado, New Mexico.
Ranunculus digitatus, Utah.
Ranunculus Eschscholtzii, Utah.
Ranunculus fascicularis, Illinois.
Ranunculus stenolobus, Utah.
Ranunculus sp., Wyoming.
Syndesmon thalictroides (*Anemonella thalictroides*), New York.
Trollius sp., New York.
TYPE LOCALITY : Europe, on *Anemone nemorosa*.
DISTRIBUTION : New England to Minnesota, Utah and Texas; also in South America, Europe and Asia.
ILLUSTRATIONS : Ann. Rep. Conn. Agr. Exp. Sta. 1889 : *pl. 2, f. 7, 8;* E. & P. Nat. Pfl. 1[1]** : 20, *f. 12 D;* Brefeld, Unters. Gesammt. Myk. **12** : *pl. 11, f. 2;* Bull. Soc. Nat. Mosc. **40**[1] : *pl. 3, f. 26;* Jahrb. Wiss. Bot. **7** : *pl. 12, f. 38–43;* Plowright, Brit. Ured. Ust. *pl. 7, f. 31–33.*
EXSICCATI : Ellis & Ev. Fungi Columb. *475, 1689;* Ellis, N. Am. Fungi *294;* Seym. & Earle, Econ. Fungi *C 59, C 60, C 129, C 130.*

3. **Urocystis carcinodes** (B. & C.) Fisch. de Waldh. Aperçu Syst. Ust. 38. 1877.

Thecaphora carcinodes B. & C. Grevillea **3** : 58. 1874.

Sori on stems, petioles, or midribs, rarely on blades, forming very conspicuous outbreaks that cause considerable distortion of infected parts, upon rupture disclosing a dusty

brown-black spore-mass; spore-balls ovoid to subspherical, firm, chiefly 25–45 μ in length; sterile cells hyaline or yellowish-tinted, ovoid to subspherical, usually completely covering the spores, often thick-walled, 6–12 μ in length; spores reddish-brown, ovoid to subspherical or polyhedral, smooth, generally 1–6 in a ball, usually 12–16 μ in length.

ON RANUNCULACEAE:
Actaea alba, West Virginia.
Actaea arguta, Utah.
Actaea sp., Pennsylvania.
Atragene occidentalis, Utah.
Cimicifuga racemosa, North Carolina, Ohio, Pennsylvania, Tennessee.
TYPE LOCALITY: Pennsylvania, on *Cimicifuga racemosa*.
DISTRIBUTION: Pennsylvania to North Carolina and Utah.
EXSICCATI: Ellis, Ev. & Barth. Fungi Columb. *1891*; Seym. & Earle, Econ. Fungi *C 131*; Kellerm. Ohio Fungi *79*.

4. **Urocystis sorosporioides** Körn.; (Fuckel, Jahrb. Nass. Ver. Nat. **29–30**: 10; hyponym. 1875) Fisch. de Waldh. Aperçu Syst. Ust. 41. 1877.

Sori on stems, petioles, and leaves, usually forming pustules of considerable size and causing more or less distortion to host, upon rupture disclosing a dusty brown-black spore-mass; spore-balls dark reddish-brown, irregular, oblong to subspherical, firm, chiefly 30–60 μ, rarely 90 μ, in length; sterile cells smoky or yellowish-tinted, usually completely covering spores, ovoid to subspherical, 8–15 μ in length; spores reddish-brown, oblong to polyhedral or subspherical, usually 4–12, rarely 1–3, smooth, chiefly 13–17 μ, the most elongate rarely 22 μ, in length.

ON RANUNCULACEAE:
Aconitum columbianum, Utah.
Aquilegia flavescens, Utah.
Aquilegia leptocera, Utah.
Delphinium scopulorum, —.
Delphinium sp., California.
Thalictrum alpinum, Greenland.
Thalictrum Fendleri, Utah.
Thalictrum sparsiflorum, Utah.
Thalictrum sp., Arizona, Massachusetts.
TYPE LOCALITY: Bonn, Germany, on *Thalictrum minus*.
DISTRIBUTION: Greenland, Massachusetts, Utah, Arizona, and California; also in Europe.

5. **Urocystis Violae** (Sow.) Fisch. de Waldh. Bull. Soc. Nat. Mosc. **40**[1]: 258. 1867.

Granularia Violae Sow. Engl. Fungi *pl. 440*. 1815.

Sori on stems, exposed rootstocks, petioles and veins of leaves, forming prominent irregular swellings often several cm. in length, rather permanently covered by the tissues but upon rupture disclosing a black-brown spore-mass; spore-balls reddish-brown, rather irregular, oblong to subspherical, chiefly 28–55 μ in length; sterile cells yellowish-tinted, with age sometimes becoming rather obscure, small, 6–10 μ in length; spores light reddish-brown, ovoid to spherical or polyhedral, chiefly 4–8 in a ball, mostly 11–15 μ in length.

ON VIOLACEAE:
Viola odorata, Canada.
Viola spp., Minnesota, Utah.
TYPE LOCALITY: Dorking, England, on *Viola* sp.
DISTRIBUTION: Canada, Minnesota, and Utah; also in Europe.
ILLUSTRATIONS: E. & P. Nat. Pfl. 1[1]**: 20, *f. 12 A–C*; Brefeld, Unters. Gesammt. Myk. 12: *pl. 11, f. 9–15*; Tubeuf, Diseases Pl. *f. 174*; Ann. Sci. Nat. VI. 10: *pl. 1, f. 1–18, 25–31*.

6. **Urocystis Lithophragmae** Garrett, sp. nov.

Sori in the leaves and petioles, more or less distorting them into dusty black powdery masses, at first covered by a whitish membrane of plant tissues; spore-balls chiefly subspherical, with cortex of sterile cells partially or rather completely covering the fertile cells, chiefly 20–30 μ in length; sterile cells ovoid to chiefly subspherical or spherical, olive-brown tinted, rather small, 6–10 μ, or the most elongate even 12 μ, in length; spores usually 1, rarely 2, reddish-brown, subspherical, chiefly 12–16 μ in length.

ON SAXIFRAGACEAE:
Lithophragma bulbifera, Utah.
Type collected in Alta Valley, Little Cottonwood Cañon, Salt Lake County, Utah, on *Lithophragma bulbifera*, by A. O. Garrett, July, 1905. Apparently this is the only smut so far reported on the Saxifragaceae.

7. **Urocystis Cepulae** Frost; Farl. Ann. Rep. Sec. Mass. Board Agr. **24**: App. 175. 1877.

Urocystis Colchici Cepulae Cooke, Gard. Chron. II. **7**: 635. 1877.

Sori in leaves, forming isolated pustules or often affecting them for the greater part of their length and breadth, sometimes occurring at their base in the bulbs, upon rupture of covering membrane disclosing a dusty black-brown spore-mass; spore-balls ovoid to spherical, small, 17–25 μ in length; sterile cells tinted, ovoid to spherical, small, rather completely covering the spores, usually 4–8 μ in length; spores reddish-brown, ovoid to spherical, usually 1, rarely 2 in a ball, chiefly 12–16 μ in length.

ON ALLIACEAE:
Allium Cepa, Connecticut, Indiana, Kansas, Massachusetts, New Jersey, New York, Ohio, Vermont.
Allium nevadense, Nevada.
TYPE LOCALITY: Green's Farms, Connecticut, on *Allium Cepa*.
DISTRIBUTION: Eastern United States where onions are in cultivation; Nevada; also in Europe.
ILLUSTRATIONS: Ann. Rep. Conn. Agr. Exp. Sta. 1889: *pl. 1, 2, f. 1, 2, 18–28;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 14, 42;* Ann. Rep. Sec. Mass. Board Agr. **24**: App. *frontisp. f. 4, 5.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *2706;* Seym. & Earle, Econ. Fungi *C 61, C 132.*

8. **Urocystis Colchici** (Schlecht.) Rab. Fungi Eur. *396*. 1861.

Caeoma Colchici Schlecht. Linnaea 1: 241. 1826.

Sori in leaves, forming slightly elevated areas of varying size and shape, showing through on both sides, at first covered by epidermis and lead-colored but eventually rupturing this and disclosing a granular reddish-black spore-mass; spore-balls dark reddish-brown, consisting of 1–3 or rarely 4 spores surrounded rather completely by a cortex of tinted, thick-walled ovoid to subspherical sterile cells (7–13 μ), 20–40 μ in length; spores medium-dark reddish-brown, irregular oblong to ovoid or subspherical, flattened where in contact, 12–20 μ in length.

ON CONVALLARIACEAE:
Salomonia commutata (*Polygonatum giganteum*), Iowa.
Vagnera amplexicaulis (*Smilacina amplexicaulis*), Montana.
Vagnera stellata (*Smilacina stellata*), Montana.
TYPE LOCALITY: Black Forest Mountains (Hercynia) Europe, on *Colchicum autumnale*.
DISTRIBUTION: Iowa and Montana; also in Europe.
ILLUSTRATIONS: Ann. Rep. Conn. Agr. Exp. Sta. 1889: *pl. 2, f. 3, 4;* Ann. Sci. Nat. VI. **10**: *pl. 1, f. 19–24, 32;* Bot. Zeit. **59**: 150.

9. **Urocystis occulta** (Wallr.) Rab.; Klotzsch, Herb. Viv. Myc. ed. 2. *393*. 1856.

Erysibe occulta Wallr. Fl. Crypt. Germ. **2**: 212. 1833.

Sori in leaves (especially on inner side of sheaths), culm and inflorescence, forming linear striae usually of great length and often merged into a continuous stratum of dusty reddish-black spore-balls; spore-balls oblong to subspherical, 16–32 μ in length; sterile cells often incompletely covering the spores, hyaline or yellowish-tinted, subspherical to oblong, usually with distended and uniformly thickened walls; spores reddish-brown, oblong to subspherical, often with sides flattened, smooth, 1 or 2, rarely 3 or 4 in a ball, 11–18 μ in length.

ON POACEAE:
Secale cereale, Connecticut, Massachusetts, Minnesota, New Jersey, New York, Ohio, Rhode Island; Nova Scotia.
TYPE LOCALITY: Germany, on *Secale cereale*.
DISTRIBUTION: Nova Scotia to Minnesota and New Jersey; also in South America, Europe, and Australia.
ILLUSTRATIONS: Ann. Rep. Conn. Agr. Exp. Sta. 1889: *pl. 2, f. 9–11;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 15, 41;* Bull. Iowa Agr. Exp. Sta. 54: *f. 120 (9);* Ann. Rep. Mass. State Agr. Exp. Sta. **9**: 248, *pl. 1, f. 4;* Brefeld, Unters. Gesammt. Myk. **12**: *pl. 11, f. 1;* Tubeuf, Diseases Pl. *f. 172;* Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3, f. 27;* Bot. Zeit. **31**: *pl. 7.*
EXSICCATI: Ellis, N. Am. Fungi *292;* Underw. & Cook, Illustr. Fungi *57;* Seym. & Earle, Econ. Fungi *98;* Kellerm. Ohio Fungi *34.*

10. **Urocystis Agropyri** (Preuss) Schröt. Abh. Schles. Ges. Abth. Nat. Med. **1869–72**: 7. 1870.

Uredo Agropyri Preuss, in Sturm, Deuts. Fl. III. 25: 1. 1848.
Urocystis Preussii Kühn; Rab. Fungi Eur. *1898*. 1874.
Urocystis Ulii Magn.; Rab. Fungi Eur. *2390*. 1878. (Type from Germany, on *Poa pratensis angustifolia*.)
Urocystis occulta Tritici Ellis, N. Am. Fungi *293*. 1879.
Urocystis Festucae Ule, Abh. Bot. Ver. Prov. Brand. **25**: 215. 1884. (Type from Germany, on *Festuca ovina*.)

Sori in various parts, most commonly in leaves, forming striae a few mm. to length of leaf, distinct or covering surface of leaf, at first lead-colored and protected by epidermis but soon rupturing and reddish-brown spores becoming scattered; spore-balls oblong to subspherical, 16–32 μ in length; sterile cells hyaline to yellowish, oblong to subspherical, usually completely covering fertile cells, outer wall apparently thin and by collapsing with age giving ridged effect to the covering; spores 1 or 2, rarely 3 or 4 in a ball, reddish-brown, oblong to subspherical, often with flattened sides, smooth, 11–18 μ in length.

ON POACEAE:
Agropyron divergens, Washington.
Agropyron occidentale, New Mexico.
Agropyron repens, Connecticut, Massachusetts, Vermont.
Bromus ciliatus, Iowa.
Bromus sp., Minnesota.
Calamagrostis canadensis, Oregon.
Elymus arenarius, Greenland.
Elymus canadensis, Illinois, Iowa, Kansas, Missouri, Nebraska, Wisconsin.
Elymus robustus, Iowa.
Elymus virginicus, Illinois, Wisconsin.
Elymus sp., Colorado, Minnesota.
TYPE LOCALITY: Hoyerswerda, Germany, on *Agropyron repens*.
DISTRIBUTION: New England to New Mexico, Oregon, and northward; also in Europe.
ILLUSTRATIONS: Bull. Iowa Agr. Exp. Sta. 54: *f. 120* (*10*, *13*); Bull. Soc. Nat. Mosc. **40**[1]: *pl. 3*, *f. 28*.
EXSICCATI: Seym. & Earle, Econ. Fungi *99*, *100*, *C56*, *C57*, *C58*; Ellis, Ev. & Barth. Fungi Columb. *1988*; Sydow, Ust. *339*; Griff. West Am. Fungi *222*; Ellis, N. Am. Fungi *293*.

11. **Urocystis Junci** Lagerh. Bot. Notiser **1888**: 201. 1888.

Sori in the culms, filling the interior, eventually rupturing and disclosing a dusty brown-black spore-mass; spore-balls variable, chiefly of 1–8 spores but rarely of more, 16–36 μ, or occasionally 50 μ, in length; sterile cells dark reddish-brown, easily collapsing and then showing as a prominent reticulate envelope completely covering the spores, about 5–9 μ in diameter; spores reddish-brown, chiefly subspherical or occasionally somewhat flattened through pressure and then more elongate, 11–16 μ in length.

ON JUNCACEAE:
Juncus balticus, Nevada.
TYPE LOCALITY: Near Pontresina, Switzerland, on *Juncus filiformis*.
DISTRIBUTION: Nevada; also in Europe.
EXSICCATI: Griff. West Am. Fungi *221*.

12. **Urocystis granulosa** Clinton, Jour. Myc. **8**: 151. 1902.

Sori in the spikelets, ovoid or oblong, about 5–10 mm. in length, chiefly confined to the inner parts but showing through the more or less infected glumes, forming a granular black spore-mass; spore-balls reddish- to black-brown, ovoid to spherical, not easily ruptured, chiefly 28–50 μ in length; sterile cells reddish-yellow, ovoid to subspherical, completely covering the spores, often somewhat indefinite in appearance through the collapsing of the outer wall, about 8–13 μ in length; spores dark reddish-brown, ovoid to spherical, or polyhedral through pressure, smooth, 1–6 or rarely more in a ball, about 13–19 μ in length.

ON POACEAE:
Stipa comata, Idaho.
TYPE LOCALITY: Idaho, on *Stipa comata*.
DISTRIBUTION: Known only from the type locality.

13. **Urocystis Hypoxyis** Thaxter, Ann. Rep. Conn. Agr. Exp. Sta. 1889 : *sub pl. 2.* 1890.

Sori in the flowers, more or less distorting and destroying the inner parts, often extending down on pedicels and peduncles for a short distance, somewhat irregular, oblong, about 1–2 cm. in length, upon rupture of protecting parts disclosing a purple-black dusty spore-mass; spore-balls chiefly ovoid to spherical, 25–60 μ in length; sterile cells reddish-yellow, completely covering the spores, ovoid, about 9–14 μ in length; spores reddish-brown, polyhedral to subspherical or spherical, occasionally ovoid to oblong, 1–8, chiefly 3–5, in a ball, usually 13–16 μ in length.

ON AMARYLLIDACEAE :
Hypoxis hirsuta (*H. erecta*), Connecticut, Massachusetts.
TYPE LOCALITY : New Haven (West Rock Park), Connecticut, on *Hypoxis erecta* (*H. hirsuta*).
DISTRIBUTION : Connecticut and Massachusetts; also in South America.
ILLUSTRATION : Ann. Rep. Conn. Agr. Exp. Sta. 1889 : *pl. 2, f. 12–14.*
EXSICCATI : Ellis & Ev. N. Am. Fungi *2688;* Seym. & Earle, Econ. Fungi *C 133.*

5. **ENTYLOMA** DeBary, Bot. Zeit. **32** : 101. 1874.

Rhamphospora D. D. Cunn. Sci. Mem. Med. Off. Army India **3** : 32. 1888.

Sori usually in the leaves, generally forming discolored but little distorted areas, permanently embedded in the tissues; spores single, produced terminally or intercalary in the fertile mycelium which does not entirely disappear through gelatinization, free (sometimes irregularly adhering through pressure), hyaline to yellowish or reddish-yellow, occasionally dark-colored, of medium size; germination by a short promycelium bearing a terminal group of sporidia which usually conjugate in pairs and produce secondary sporidia or infection-threads; conidia often present, formed by germination of the spores *in situ* or on the mycelium, protruding through the stomata, hyaline, usually elongate.

Type, *Protomyces microsporus* Ung.

Sori black; spores tinted reddish-brown, often adhering together.
  Spores chiefly 8–14 μ in length.
    Sori forming oblong to linear striae.
      Spores 7–11 μ in length. — 1. *E. lineatum.*
      Spores 8–14 μ in length.
        Spores chiefly regular. — 2. *E. crastophilum.*
        Spores often irregular and elongate. — 3. *E. irregulare.*
    Sori often fusing to form a continuous stratum. — 4. *E. speciosum.*
  Spores chiefly 15–22 μ in length. — 5. *E. caricinum.*
Sori white to reddish-brown; spores hyaline or yellowish-tinted.
  Spores not apiculate, often adhering somewhat.
    Sori thin — in the unthickened tissues.
      Conidia or sporidia hypophyllous.
        Spores chiefly 8–13 μ in length, thin-walled (see also no. 16).
          Sori angular.
            Sori without evident hypophyllous growth. — 6. *E. Thalictri.*
            Sori with evident hypophyllous growth.
              Hosts : Ambrosiaceae, Carduaceae, Cichoriaceae. — 9. *E. compositarum.*
              Hosts : Menispermaceae. — 8. *E. Menispermi.*
          Sori circular. — 14. *E. Floerkeae.*
        Spores chiefly 11–16 μ in length, thick-walled.
          Spore-walls evidently double.
            Spore-walls not papillate. — 7. *E. Ranunculi.*
            Spore-walls, occasionally, with evident papillae. — 12. *E. arnicale.*
          Double walls of spores not very evident.
            Sori rather conspicuous, 2–5 mm. or even larger.
              Sori yellowish above, white beneath; spores often 9–12 μ. — 16. *E. Lobeliae.*
              Sori yellowish or reddish-brown, often bordered. — 17. *E. australe.*
            Sori small, usually less than 2 mm. in diameter.
              Sori angular, usually with evident whitish growths. — 19. *E. Saniculae.*
              Sori chiefly subcircular. — 21. *E. Linariae.*
        Spores chiefly 14–19 μ in length.
          Spores regular, subspherical. — 22. *E. Ellisii.*
          Spores ovoid to subspherical, often angular. — 24. *E. fuscum.*
      Conidia lacking or not observed.
        Hosts : Ambrosiaceae, Carduaceae.
          Sori often indefinite. — 10. *E. polysporum.*

Sori conspicuous, reddish-brown.	11. *E. Holwayi.*
Sori often concavo-convex.	13. *E. guaraniticum.*
Hosts: not Ambrosiaceae nor Carduaceae.	
Sori showing on both surfaces of leaves.	
Spores often with hyphal pedicels.	15. *E. Collinsiae.*
Spores without hyphal pedicels.	
Sori subcircular, conspicuous, 2 mm. or more.	18. *E. serotinum.*
Sori angular, often indefinite, less than 2 mm.	20. *E. Eryngii.*
Sori small, usually bordered.	23. *E. Eschscholtziae.*
Sori hypophyllous only.	21. *E. Linariae.*
Sori forming hard pustules, often concavo-convex.	25. *E. microsporum.*
Spores apiculate and pedicellate, never adhering.	26. *E. Nymphaeae.*

1. **Entyloma lineatum** (Cooke) Davis, Trans. Wisc. Acad. 9: 162. 1893.

Ustilago lineata Cooke; (Rav. Fungi Am. *789;* hyponym. 1882) Sacc. Syll. 7: 456. 1888. *Entyloma Pammelii* Hume, Proc. Iowa Acad. Sci. 9: 238. 1902. (Type from Iowa, on *Zizania aquatica.*)

Sori in the leaves, leaf-sheaths, and culms, small, 0.5–3 mm. in length, subcircular to linear, scattered or fusing though even then not always completely losing their individuality, lead-colored, rather permanently covered by epidermis; spores light golden-brown, firmly agglutinated, usually ovoid to subspherical or somewhat polyhedral, smooth, chiefly 7–11 μ in length.

ON POACEAE:
Zizania aquatica, Connecticut, Georgia, Illinois, Iowa, Nebraska, South Dakota, Wisconsin.
TYPE LOCALITY: Darien, Georgia, on *Zizania aquatica.*
DISTRIBUTION: Connecticut; Georgia; Illinois to South Dakota.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 16, 32.*
EXSICCATI: Seym. & Earle, Econ. Fungi *C 21;* Rav. Fungi Am. *789;* Ellis, N. Am. Fungi *1097;* Ellis & Ev. Fungi Columb. *134;* Griff. West Am. Fungi *16.*

2. **Entyloma crastophilum** Sacc. Michelia **1**: 540. 1879.

Sori in leaves, subcircular to linear, about 0.25–2 mm. in length, usually distinct though occasionally merged, black, long covered by epidermis; spores rather dark-brown, tightly packed and more or less adhering together, chiefly ovoid to spherical or angled through pressure, rather thick-walled, 8–14 μ in length.

ON POACEAE:
Agrostis alba vulgaris, Wisconsin.
Calabrosa aquatica, Utah.
Holcus lanatus, Connecticut, New York.
Phleum pratense, Illinois, Iowa.
TYPE LOCALITY: Mantua, Italy, on *Poa annua.*
DISTRIBUTION: Connecticut, New York, Wisconsin, Illinois, Iowa, and Utah; also in South America and Europe.

3. **Entyloma irregulare** Johans. Oefv. K. Sv. Vet.-Akad. Förh. **41**[9]: 159. 1885.

Sori in leaves, subcircular to oblong, about 1 mm., distinct or somewhat merging into one another, lead-colored, long covered by epidermis; spores almost colorless to very light-brown, very irregular to subspherical or polyhedral, chiefly 8–14 μ, the most elongate occasionally 17 μ, in length; conidia often present in very small white clusters on sori.

ON POACEAE:
Poa pratensis, Illinois.
TYPE LOCALITY: Iceland, on *Poa annua.*
DISTRIBUTION: Illinois; also in Europe.

4. **Entyloma speciosum** Schröt. & P. Henn. Hedwigia **35**: 220. 1896.

Sori in the leaves, oval to linear, about 2–10 mm. long, though usually completely losing individuality by lateral and terminal fusing and thus occupying more or less of the leaf, lead-colored, permanently covered by epidermis and completely filling the space between its layers; spores dark-brown, rather firmly agglutinated, polyhedral (occasionally subspherical) to more irregular or elongate, smooth, chiefly 8–14 μ, the most elongate rarely 16 μ, in length.

ON POACEAE:
Alopecurus geniculatus, Texas.
Panicum proliferum, Illinois.
Panicum sp., Illinois.
TYPE LOCALITY: Tubarão, Brazil, on *Panicum* sp.
DISTRIBUTION: Illinois and Texas; also in South America.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 32*, *C 33*.

5. **Entyloma caricinum** Rostr. Medd. Grønland **3**: 532. 1888.

Sori in leaves, oblong, gregarious, 1–2 mm. in length, black; spores brown-black, rather firmly coalescing, variable, angular, smooth, 15–22 μ in length.

ON CYPERACEAE:
Carex rigida, Greenland.
TYPE LOCALITY: Greenland, on *Carex rigida*.
DISTRIBUTION: Known only from the type locality.

6. **Entyloma Thalictri** Schröt. Krypt. Fl. Schles. **3**[1]: 282. 1887.[1]

Entyloma Ranunculi f. *Thalictri* Farl. Bot. Gaz. **8**: 275. 1883.

Sori in leaves, forming small angular yellowish or reddish areas, about 1–2 mm. or by confluence more extended, often rather indefinite; spores often not very abundant, hyaline to yellowish, ovoid to subspherical or occasionally somewhat angled and more irregular, thin-walled to medium thick-walled, smooth, small, about 8–13 μ in length; conidia apparently hypophyllous.

ON RANUNCULACEAE:
Thalictrum dioicum, Wisconsin.
Thalictrum polygamum, Connecticut.
Thalictrum purpurascens, Illinois.
TYPE LOCALITY: Silesia, on *Thalictrum minus sylvaticum*.
DISTRIBUTION: Connecticut, Wisconsin, and Illinois; also in Europe.
EXSICCATI: Rab.-Wint. Fungi Eur. *3406*; Roum. Fungi Gall. *3961*; Ellis, N. Am. Fungi *1489*; Seym. & Earle, Econ. Fungi *C 34*, *C 112*.

7. **Entyloma Ranunculi** (Bon.) Schröt. Beitr. Biol. Pfl. **2**: 370. 1877.

Fusidium Ranunculi Bon. Handb. Myk. 43. 1851.
Entyloma Ficariae Fisch. de Waldh. Bull. Soc. Nat. Mosc. **52**[1]: 309. 1877. (Type from Germany, on *Ranunculus Ficaria*.)

Sori in leaves, forming thin subcircular or angular reddish-yellow spots on upper side but more conspicuous beneath by the whitish growth of conidia (rarely epiphyllous), about 1–6 mm. in length; spores yellowish-tinted when young but often reddish-yellow with age, chiefly subspherical or spherical, though occasionally more elongate or irregular, thick-walled, epispore usually evident and sometimes wrinkled or loosely investing endospore, 11–16 μ in length; conidia apparently of two types, either long-fusiform, often curved, 35–45 $\mu \times$ 2.5–3 μ, or short-fusiform, often curved near tip, 15–20 $\mu \times$ 2.5–3.5 μ, usually disappearing through germination.

ON RANUNCULACEAE:
Anemone quinquefolia (*A. nemorosa*), Wisconsin.
Ranunculus eremogenes, Washington.
Ranunculus pennsylvanicus, Wisconsin.
TYPE LOCALITY: Europe, on *Ranunculus Ficaria* (*Ficaria Ficaria*).
DISTRIBUTION: Wisconsin and Washington; also in Europe.
ILLUSTRATION: Phil. Trans. Roy. Soc. Lond. **178**: 173.

8. **Entyloma Menispermi** Farl. & Trel. Bot. Gaz. **8**: 275. 1883.

Sori in leaves, small, angular, limited by veins, scattered or often abundant and somewhat confluent, showing above as reddish-brown discolorations and beneath as more evident whitish areas often with a dense conidial outgrowth; spores hyaline to yellowish, chiefly subspherical or spherical, thin-walled, smooth, 8–12 μ in diameter; conidia (with mycelial outgrowth) forming a conspicuous hypophyllous mat, subclavate or fusoid, often adhering in pairs, 12–24 $\mu \times$ 3–5 μ.

ON MENISPERMACEAE:
Menispermum canadense, Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Wisconsin.

[1] Listed by Schröter in Jahresb. Schles. Ges. **60**: 178. 1883.

TYPE LOCALITY: Madison, Wisconsin, on *Menispermum canadense*.
DISTRIBUTION: Illinois and Wisconsin to Kansas and North Dakota.
EXSICCATI: Ellis, N. Am. Fungi *1490*; Underw. & Cook, Illustr. Fungi *59*; Ellis & Ev. Fungi Columb. *1066*; Rab.-Wint. Fungi Eur. *3002*; Seym. & Earle, Econ. Fungi *201*, *C 23*, *C 24*.

9. **Entyloma compositarum** Farl. Bot. Gaz. 8: 275. 1883.

Sori in leaves, small, angular, about 1–2 mm. in length, usually abundant and more or less confluent, forming spots whitish or yellowish on the under side and darker often purplish on the upper; spores chiefly hyaline, ovoid to spherical or occasionally polyhedral, smooth, thin-walled, chiefly 9–14 μ in length; usually with evident hypophyllous outgrowth of conidia which are fusiform or slightly clavate, often curved, about 15–20 $\mu \times$ 2–3 μ.

ON AMBROSIACEAE:
Ambrosia artemisiaefolia, Maine, Massachusetts.
Ambrosia psilostachya, Kansas, Wisconsin.
Ambrosia trifida, District of Columbia, Illinois, Missouri, Wisconsin.
Ambrosia sp., Minnesota, Ohio.
ON CARDUACEAE:
Aster cordifolius, Massachusetts.
Aster Novi-Belgii, Maine, Massachusetts.
Aster paniculatus, Wisconsin.
Aster puniceus, Massachusetts, New Hampshire, Wisconsin.
Aster sp., Delaware; New Brunswick.
Bidens laevis (*B. chrysanthemoides*), Kansas.
Erigeron elatus, Washington.
Erigeron philadelphicus, North Dakota, Wisconsin.
Erigeron salsuginosus, Washington.
Eupatorium ageratoides, Illinois, Iowa.
Gnaphalium sp., Alabama.
Helenium autumnale, Wisconsin.
Heterotheca subaxillaris (*H. Lamarckii*), Kansas.
Ratibida pinnata (*Lepachys pinnata*), Illinois, Iowa, Michigan, Minnesota, Wisconsin.
Rudbeckia laciniata, Missouri, Ohio,
Senecio aureus, Nebraska, Wisconsin.
Senecio Balsamitae (*S. aureus Balsamitae*), Kansas.
Silphium integrifolium, Wisconsin.
ON CICHORIACEAE:
Lactuca canadensis, Minnesota.
TYPE LOCALITY: New England, on *Aster puniceus*.
DISTRIBUTION: New Brunswick to Alabama and Washington.
ILLUSTRATION: Bot. Gaz. 19: *pl. 18, f. 8*.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1492a*, *2429a*, *2429b*; Seym. & Earle, Econ. Fungi *C 16*, *C 17*, *C 18*.

10. **Entyloma polysporum** (Peck) Farl. Bot. Gaz. 8: 275. 1883.

Protomyces polysporus Peck; Thüm. Myc. Univ. *1813*. 1881.

Sori in leaves, forming subcircular to more irregular and often indefinite areas, generally dark-brown, 2–5 mm., usually limited in number and killing more or less of the surrounding tissue; spores hyaline to yellowish or even light chestnut-brown, ovoid to spherical or somewhat polyhedral, smooth, usually with remains of the gelatinous hypha forming outer coat of the thick wall, 12–17 μ or in some cases even 20 μ in length; evidence of conidia usually lacking.

ON AMBROSIACEAE:
Ambrosia artemisiaefolia, Connecticut, Illinois, Indiana, Iowa, Michigan, New York, Wisconsin.
Ambrosia bidentata, Illinois.
Ambrosia trifida, Illinois, Iowa, New York.
ON CARDUACEAE:
Gaillardia pulchella, Kansas.
Helianthus annuus, Montana.
TYPE LOCALITY: Albany, New York, on *Ambrosia trifida*.
DISTRIBUTION: Connecticut to Montana and Kansas.
EXSICCATI: Ellis, N. Am. Fungi *1492b*; Seym. & Earle, Econ. Fungi *292a–b*, *C 31*; Ellis & Ev. Fungi Columb. *541*; Roum. Fungi Sel. *4868*; Thüm. Myc. Univ. *1813*.

11. **Entyloma Holwayi** Sydow, Ust. *282*. 1901.

Sori in leaves, forming subcircular or angular spots showing through on both surfaces, at first yellowish but finally reddish-brown, distinct or rarely subconfluent, 2–6 mm. in diameter; spores hyaline to evidently tinted reddish-brown, ovoid to chiefly subspherical,

smooth, with evident double walls, the outer usually irregularly thickened, 12–15 μ or even 17 μ in length; conidia not observed.

ON CARDUACEAE:
Cosmos sulphureus, Mexico.
TYPE LOCALITY: Chapala, Mexico, on *Cosmos sulphureus*.
DISTRIBUTION: Known only from the type locality.
EXSICCATI: Sydow, Ust. *282*; Seym. & Earle, Econ. Fungi *C 108*.

12. **Entyloma arnicale** Ellis & Ev. (N. Am. Fungi *3136*; hyponym. 1894) Bull. Torrey Club **22**: 57. 1895.

Ramularia arnicalis Ellis & Ev. Proc. Acad. Nat. Sci. Phila. **1891**: 85. 1891.

Sori in leaves, forming reddish-brown subcircular or angular areas, prominent on upper surface, 3–8 mm. in diameter, distinct or often killing intervening tissue and thus forming an extended dead area; spores yellowish to chestnut-brown, rather uniform, chiefly subspherical or spherical, often with evidence of gelatinous envelope which in some cases forms conspicuous papillae on the rather thick spore-wall, chiefly 13–17 μ in diameter; conidia forming a slight hypophyllous growth in center of area, chiefly linear-lanceolate, often slightly curved at upper end, about 18–28 $\mu \times 3\ \mu$.

ON CARDUACEAE:
Arnica Chamissonis, Washington.
Arnica cordifolia, Idaho.
Arnica latifolia, Washington.
TYPE LOCALITY: Mountains of Skamania County, Washington, on *Arnica Chamissonis*.
DISTRIBUTION: Idaho and Washington.
EXSICCATI: Ellis & Ev. N. Am. Fungi *3136*; Ellis & Ev. Fungi Columb. *540*.

13. **Entyloma guaraniticum** Speg. Anal. Soc. Ci. Argent. **17**: 127. 1884.

Sori in leaves, subcircular, lightish or eventually dark-colored, usually separate, often thickened and concavo-convex, 2–6 mm. in diameter; spores hyaline to light-yellow, more or less adhering in masses or uniserial rows, subspherical to oblong or more irregular, provided with a prominent gelatinous envelope which is not always distinct from the cell-wall, 11–20 μ in length.

ON CARDUACEAE:
? *Bidens frondosa*, Massachusetts.
Bidens leucantha, Florida; Porto Rico.
TYPE LOCALITY: Paraguay, on *Bidens leucantha*.
DISTRIBUTION: Massachusetts and Florida; Porto Rico; also in South America.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 107*.

14. **Entyloma Floerkeae** Holway; (Ellis & Ev. N. Am. Fungi *2288*; hyponym. 1889) Davis, Trans. Wisc. Acad. **11**: 170. 1897.

Sori in leaves, yellowish, often killing tissues, showing on both sides, oval to circular, about 2–4 mm. in length; spores hyaline to reddish-yellow, ovoid to chiefly subspherical or spherical, with moderately thin wall, often with remains of hypha showing as a short appendix, smooth, 9–13 μ in length; conidia hypophyllous, not forming a very prominent growth, slightly falcate, 12–16 $\mu \times 1.5\ \mu$.

ON LIMNANTHACEAE:
Floerkea proserpinacoides, Illinois, Ohio, Wisconsin.
TYPE LOCALITY: Racine, Wisconsin, on *Floerkea proserpinacoides*.
DISTRIBUTION: Ohio, Illinois, and Wisconsin.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2288*, *3237*; Seym. & Earle, Econ. Fungi *C 106*.

15. **Entyloma Collinsiae** Hark. Bull. Calif. Acad. Sci. **1**: 40. 1884.

Sori in leaves, whitish, showing on both surfaces, but somewhat darker-colored above, subcircular, thin, 1–3 mm. in diameter; spores tinted reddish-yellow, ovoid to chiefly subspherical or spherical, thick-walled, often with remnant of hypha showing as a short pedicel, 10–14 μ in length; conidia not observed.

ON SCROPHULARIACEAE:
Collinsia bartsiaefolia, California.
TYPE LOCALITY: Mt. Tamalpais, California, on *Collinsia bartsiaefolia*.
DISTRIBUTION: Known only from the type locality.

16. **Entyloma Lobeliae** Farl. Bot. Gaz. **8**: 275. 1883.

Sori in leaves, forming thin yellowish areas, whitish beneath, 1–10 mm. in diameter; spores hyaline to yellowish, oblong to subspherical, more or less angled, rather thick-walled, chiefly 9–12 μ, rarely 15 μ, in length; conidia hypophyllous, narrowly fusiform, 10–25 $\mu \times$ 2–3 μ.

ON LOBELIACEAE:
Lobelia inflata, Connecticut, Illinois, Maine, Massachusetts, Missouri, New Hampshire, North Carolina, Ohio, Wisconsin.
Lobelia sp., Porto Rico.
TYPE LOCALITY: Gilead, Maine, on *Lobelia inflata*.
DISTRIBUTION: New England to Wisconsin, Missouri, and North Carolina; Porto Rico.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 17, 31.*
EXSICCATI: Rab.-Wint. Fungi Eur. *3302*; Ellis, N. Am. Fungi *1493*; Seym. & Earle, Econ. Fungi *326, C 22, C 110.*

17. **Entyloma australe** Speg. Anal. Soc. Ci. Argent. **10**: 5. Jl 1880.

Protomyces Physalidis Kalchb. & Cooke, Grevillea **9**: 22. S 1880.
Entyloma Besseyi Farl. Bot. Gaz. **8**: 275. 1883. (Type from Iowa, on *Physalis* sp.)
Entyloma Physalidis Wint. Hedwigia **22**: 130. 1883. (Type from South Africa, on *Physalis Hornemanni*.)

Sori in leaves, forming thin at first light-yellow but later darker-colored roundish or angular areas, usually 0.5–6 mm. in length; spores light- to reddish-yellow, ovoid to spherical or slightly angled, usually with apparently thick wall, chiefly 10–16 μ in length; conidia forming whitish epi- or hypophyllous growths, linear, somewhat curved, usually 30–55 $\mu \times$ 1–2 μ.

ON SOLANACEAE:
Physalis angulata, Mississippi.
Physalis heterophylla, Iowa.
Physalis lanceolata, Illinois, Iowa, Kansas, Ohio, South Dakota.
Physalis longifolia (*P. lanceolata laevigata*), Kansas.
Physalis philadelphica, Indiana, Iowa.
Physalis pubescens, Connecticut, Illinois, Indiana, Kansas, Texas, Wisconsin.
Physalis virginiana, Connecticut, Delaware, Illinois, Iowa, Massachusetts, Michigan, New Jersey, New York, Pennsylvania, Wisconsin; Canada.
Physalis sp., Connecticut, Iowa, Kansas, Kentucky, Minnesota, Nebraska, New York, Texas, Wisconsin; Porto Rico.
Solanum nigrum, Iowa, Kansas.
Solanum triflorum, North Dakota.
Solanum sp., Florida.
TYPE LOCALITY: Argentina, on *Physalis hirsuta*.
DISTRIBUTION: New England to North Dakota, Florida, and Texas; Canada; Porto Rico; also in South America and Africa.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 34.*
EXSICCATI: Kellerm. & Swingle, Kan. Fungi *38a, 38b*; Ellis & Ev. Fungi Columb. *43, 1532*; Seym. & Earle, Econ. Fungi *341, C 29, C 30, C 111*; Ellis, N. Am. Fungi *1491a–b*; Rab.-Wint. Fungi Eur. *3405.*

18. **Entyloma serotinum** Schröt. Beitr. Biol. Pfl. **2**: 437. 1877.

Entyloma leuto-maculans Hume, Proc. Iowa Acad. Sci. **9**: 238. 1902. (Type from Iowa, on *Mertensia virginica*.)

Sori in leaves, subcircular, about 2–5 mm. in diameter, thin, light-colored, sometimes with slightly darker border, usually showing on both surfaces though more plainly below; spores hyaline to light reddish-yellow, ovoid to chiefly subspherical or spherical, occasionally slightly angled, with medium thick wall, smooth, 11–15 μ in length; conidia not observed.

ON BORAGINACEAE:
Mertensia virginica, Iowa, Maryland.
TYPE LOCALITY: Rastatt, Germany, on *Symphytum officinale*.
DISTRIBUTION: Maryland and Iowa; also in Europe.
ILLUSTRATION: E. & P. Nat. Pfl. 1^{**}: 17, *f. 10A.*

19. **Entyloma Saniculae** Peck, Ann. Rep. N. Y. State Mus. **38**: 100. 1885.

Sori in leaves, forming small whitish to reddish-brown usually angular areas, limited by the veins, about 0.5–2 mm., showing on both surfaces but more plainly below, often with

slight border on upper surface; spores light to reddish-yellow, ovoid to chiefly subspherical or spherical, thick-walled, smooth, 11–16 μ in length; conidia chiefly hypophyllous, often in dense white tufts, filiform, tapering, often curved, about 30–45 $\mu \times 1.5$ μ.

ON AMMIACEAE:
Sanicula marylandica, Illinois, Iowa, New York, Wisconsin.
Sanicula Menziesii, California.
Sanicula sp., Alabama, Indiana.
TYPE LOCALITY: North Greenbush, New York, on *Sanicula marylandica*.
DISTRIBUTION: New York to Wisconsin and Alabama; California.
ILLUSTRATION: Ann. Rep. N. Y. State Mus. **38**: *pl. 1, f. 7–9.*

20. **Entyloma Eryngii** (Corda) DeBary, Bot. Zeit. **32**: 105. 1874.

Physoderma Eryngii Corda, Ic. Fung. **3**: 3. 1839.
Protomyces Eryngii Fuckel, Symb. Myc. 75. 1869.

Sori in leaves, varying somewhat with the host, small, polygonal, or more elongate, often confluent, at first yellowish but eventually light reddish-brown, showing on both surfaces; spores light- to reddish-yellow, ovoid to subspherical or often polyhedral or more irregular through pressure, thick-walled, smooth, usually 11–17 μ in length; conidia unknown.

ON AMMIACEAE:
Eryngium aquaticum (*E. yuccaefolium*), Iowa.
TYPE LOCALITY: Prague, Austro-Hungary, on *Eryngium campestre*.
DISTRIBUTION: Iowa; also in Europe.
ILLUSTRATIONS: Corda, Ic. Fung. **3**: *pl. 1, f. 8;* Bot. Zeit. **32**: *pl. 2, f. 23, 24.*

21. **Entyloma Linariae** Schröt. Beitr. Biol. Pfl. **2**: 371. 1877.

Sori in leaves, forming hypophyllous yellowish more or less defined spots, scattered or somewhat confluent, thin, oval to circular, about 0.5–2 mm. in length; spores hyaline to yellowish, chiefly subspherical or spherical, smooth, with evident double wall, 11–15 μ in length; conidia apparently lacking.

ON SCROPHULARIACEAE:
Linaria Linaria (*L. vulgaris*), Connecticut, New Jersey.
TYPE LOCALITY: Liegnitz, Germany, on *Linaria vulgaris*.
DISTRIBUTION: Connecticut and New Jersey; also in Europe.
ILLUSTRATION: Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 30.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *2428;* Seym. & Earle, Econ. Fungi *C 109.*

Entyloma Linariae Veronicae Wint.; Rab.-Wint. Fungi Eur. *3001.* 1884. *Entyloma Veronicae* Lagerh.; Pat. & Lagerh. Bull. Soc. Myc. Fr. **7**: 170. 1891. Sori usually showing on both surfaces and thus more evident than with the species; spores often deeper-tinted and larger, 13–16 μ, or the most elongate sometimes 19 μ, in length; conidia described as 27–30 $\mu \times 2$ μ. ON SCROPHULARIACEAE: *Veronica americana*, Colorado, New York. *Veronica peregrina*, Connecticut, Illinois, Iowa, Maryland, Missouri, Wisconsin. DISTRIBUTION: Connecticut to Wisconsin, Maryland, and Colorado; also in South America. EXSICCATI: Ellis, N. Am. Fungi *1487;* Rab.-Wint. Fungi Eur. *3001;* Seym. & Earle, Econ. Fungi *C 20.*

22. **Entyloma Ellisii** Halsted, Bull. Torrey Club **17**: 95. 1890.

Sori in leaves, forming pale white spots, indefinitely limited, subconfluent; spores hyaline or slightly yellowish-tinted, clustered in the intercellular spaces beneath the stomata, spherical, thick-walled (2–5 μ), chiefly 16–20 μ but varying from 11 to 25 μ in diameter; conidia hypophyllous, abundant, acicular, small, 10–14 μ by less than 1 μ.

ON CHENOPODIACEAE:
Spinacia oleracea, New Jersey.
TYPE LOCALITY: In hot-beds, Newark, New Jersey, on *Spinacia oleracea*.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Bull. New Jersey Agr. Exp. Sta. 70: *f. 14–16.*

23. **Entyloma Eschscholtziae** Hark. Bull. Calif. Acad. Sci. **1**: 40. 1884.

Sori in leaves, forming whitish subcircular areas, usually with reddish-purple border or discoloration on the upper side, about 1 mm. in diameter; spores hyaline to reddish-yellow, somewhat ovoid or subspherical but chiefly of more or less irregular polyhedral form through pressure, adhering together rather firmly, with evidence of gelatinous sheath, smooth, 10–15 μ in length; conidia not observed.

ON PAPAVERACEAE:
Dendromecon sp., California.

Eschscholtzia californica, California.
TYPE LOCALITY: San Francisco, California, on *Eschscholtzia californica*.
DISTRIBUTION: California.

24. **Entyloma fuscum** Schröt. Beitr. Biol. Pfl. **2**: 373. 1877.

Entyloma fuscellum Schröt.; Rab. Fungi Eur. *2495*. 1878.
Entyloma bicolor Zopf; Rab. Fungi Eur. *2496*. 1878.

Sori in leaves, forming discolored somewhat irregular areas usually limited by the veins, about 2–6 mm. or by confluence much more extended, often with conspicuous white hypophyllous outgrowths; spores when fully matured light-yellow to chestnut-brown, ovoid to subspherical or occasionally somewhat angled, provided (especially when young) with a conspicuously swollen gelatinous envelope, smooth, chiefly 13–19 μ in length; the hypophyllous matted outgrowths usually showing few conidia which are described as fusiform, single-celled or septate, 10–22 $\mu \times 3\ \mu$.

ON PAPAVERACEAE:
Papaver sp. (cult.), Maine; New Brunswick.
TYPE LOCALITY: Germany (Rastatt, apparently), on *Papaver Argemone*.
DISTRIBUTION: Maine and New Brunswick; also in Europe.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 19*.

25. **Entyloma microsporum** (Ung.) Schröt.; Rab. Fungi Eur. *1872*. 1874.

Protomyces microsporus Ung. Exanth. Pfl. 343. 1833.
Entyloma Ungerianum DeBary, Bot. Zeit. **32**: 105. 1874.

Sori in leaves, forming hard fusoid to hemispherical pustules, often concavo-convex, 2–5 mm. in length, usually distinct, whitish or eventually reddish-brown; spores hyaline or slightly tinted, oblong or ovoid to subspherical or polyhedral, with a very thick usually irregular epispore which is often somewhat crenate, 12–22 μ in length; conidia not known.

ON RANUNCULACEAE:
Ranunculus fascicularis, Wisconsin.
Ranunculus septentrionalis, Illinois, Iowa, Wisconsin.
Ranunculus sp., Iowa.
TYPE LOCALITY: Europe, on *Ranunculus repens*.
DISTRIBUTION: Illinois, Iowa, and Wisconsin; also in Europe.
ILLUSTRATION: Bot. Zeit. **32**: *pl. 2, f. 1–13*.
EXSICCATI: Ellis & Ev. Fungi Columb. *542*; Ellis, N. Am. Fungi *1488*; Seym. & Earle, Econ. Fungi *C 25*, *C 26*.

Entyloma microsporum pygmaeum Allesch. Bibl. Bot. **8**: 40. 1897. Sori in leaves; spores hyaline to yellowish, irregular, oblong, spherical, frequently polyhedral, with large oil-drops, variable in size, 12–18 μ in length. ON RANUNCULACEAE: *Ranunculus pygmaeus*, Greenland.

26. **Entyloma Nymphaeae** (D. D. Cunn.) Setch. Bot. Gaz. **19**: 189. 1894.

Rhamphospora Nymphaeae D. D. Cunn. Sci. Mem. Med. Off. Army India **3**: 32. 1888.
Entyloma Castaliae Holway; Davis, Trans. Wisc. Acad. **11**: 174. 1897. (Type from Wisconsin, on *Nymphaea reniformis*).

Sori in leaves, forming variable often very irregular areas, usually most prominent on under side, yellowish or with age reddish-brown, scattered or subconfluent; spores hyaline, ovoid to subspherical, usually apiculate and with remains of hypha as an appendix at the opposite end, smooth or under an immersion very minutely verruculose, 10–14 μ in length; conidia not observed but spores said to germinate *in situ*.

ON NYMPHAEACEAE:
Castalia odorata (*Nymphaea odorata*), Connecticut, Massachusetts, Ohio.
Castalia tuberosa (*Nymphaea reniformis*), Illinois, Iowa, Wisconsin.
Castalia (*Nymphaea*) sp., Iowa, New Jersey, Ohio.
Nymphaea advena (*Nuphar advena*), Connecticut, Illinois, Massachusetts, Wisconsin.
TYPE LOCALITY: Calcutta, India (Botanical Garden), on *Nymphaea stellata* (*Castalia stellata*).
DISTRIBUTION: New England to Wisconsin and Iowa; also in Europe and Asia.
ILLUSTRATIONS: Sci. Mem. Med. Off. Army India **3**: *pl. 1, 2*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 18, 33*.
EXSICCATI: Sydow, Ust. *277*; Ellis & Ev. Fungi Columb. *1487*; Seym. & Earle, Econ. Fungi *C 27*, *C 28*.

DOUBTFUL SPECIES

Entyloma Alsines Halsted, Bull. Torrey Club **20**: 252. 1893. On *Alsine media*. No spores found.

6. **BURRILLIA** Setch. Proc. Am. Acad. **26**: 18. 1891.

Sori in various parts of the host, generally in the leaves, rather permanently imbedded in the tissues; spore-balls without a distinct cortex of sterile cells, conspicuous, composed entirely of fertile cells or with some sterile parenchymatous cells; spores hyaline or yellowish, rather firmly united, of medium size, similar to those of *Entyloma*; germination similar to that of *Entyloma*.

Type, *Burrillia pustulata* Setch.

Sori forming scarcely thickened spots in leaves.
Spore-balls small, 75–140 μ. 1. *B. decipiens.*
Spore-balls large, 160–250 μ. 2. *B. Echinodori.*
Sori forming small hypophyllous blisters. 3. *B. pustulata.*

1. **Burrillia decipiens** (Wint.) Clinton, Jour. Myc. **8**: 154. 1902.

Doassansia decipiens Wint. Jour. Myc. 1: 102. 1885.

Sori in leaves, forming yellowish circular areas, thin, with spore-balls showing as minute elevations; spore-balls situated chiefly in the palisade-layer, densely clustered, consisting of a firmly adhering mass of spores without a definite cortex though partially covered with remains of dark-brown thick-walled sterile threads, chiefly subspherical, 75–140 μ in diameter; spores pale, polyhedral or often more irregular, with moderately thick smooth walls, 8–12 μ in diameter.

ON MENYANTHACEAE:
Limnanthemum lacunosum, New Jersey.
TYPE LOCALITY: Green Pond, Morris County, New Jersey, on *Limnanthemum lacunosum*.
DISTRIBUTION: Known only from the type locality.

2. **Burrillia Echinodori** Clinton, Jour. Myc. **8**: 154. 1902.

Sori in leaves, forming irregular to subcircular areas, showing spore-balls as closely clustered very minute elevations on both surfaces; usually a single spore-ball occupying entire section of leaf between layers of the epidermis, more or less merged sidewise, often irregular but chiefly oblong to subspherical, without distinct cortex but composed of sterile cells and spores intermixed, chiefly 160–250 μ in length; sterile cells light reddish-brown with thinner walls than the spores and more irregular in shape and size; spores light-colored, chiefly ovoid to spherical, occasionally somewhat flattened, apparently thick-walled, 12–18 μ in length.

ON ALISMACEAE:
Echinodorus cordifolius (*E. rostratus*), California, Florida.
TYPE LOCALITY: Lower Matecumbe, Florida, on *Echinodorus rostratus* (*E. cordifolius*).
DISTRIBUTION: Florida and California.

3. **Burrillia pustulata** Setch. Proc. Am. Acad. **26**: 18. 1891.

Doassansiopsis pustulata Dietel, in E. & P. Nat. Pfl. 1^{1**}: 22. 1897.

Sori in leaves, forming small hypophyllous blisters irregularly clustered or scattered over the surface and eventually rupturing, showing above as small more or less distinct yellowish or reddish-brown areas; spore-balls situated in the spongy parenchyma, consisting of several irregular layers of fertile cells within which is a central mass of parenchymatous cells with oily contents, ellipsoidal, large, 200–350 μ in length; spores rather firmly adhering, subspherical or polyhedral, rarely more irregular, chiefly 8–12 μ in diameter.

ON ALISMACEAE:
Sagittaria latifolia (*S. variabilis*), Illinois, Nebraska, Wisconsin.
TYPE LOCALITY: Dixon, Illinois, on *Sagittaria variabilis* (*S. latifolia*).
DISTRIBUTION: Illinois, Wisconsin, and Nebraska.
ILLUSTRATION: Ann. Bot. 6: *pl. 2, f. 84.*
EXSICCATI: Seym. & Earle, Econ. Fungi, *C 1.*

EXCLUDED SPECIES

Burrillia globulifera Davis, Bot. Gaz. **22**: 414. 1896. (*Doassansiopsis globulifera* Dietel, in E. & P. Nat. Pfl. 1^{1**}: 22. 1897.) On *Glyceria fluitans*. Sclerotium of some fungus.

7. DOASSANSIA Cornu, Ann. Sci. Nat. VI. 15: 285. 1883.

Setchellia Magn. Ber. Deuts. Bot. Ges. 13: 468. 1895.
Doassansiopsis Dietel, in E. & P. Nat. Pfl. 1^{1**}: 21. 1897.

Sori in various parts of the host, usually in the leaves, rather permanently embedded in the tissues; spore-balls conspicuous, permanent, consisting of a distinct cortical layer and a central mass of fertile cells entirely filling the interior or with innermost spores supplanted by parenchymatous cells or hyphal threads; spores hyaline or yellowish, with smooth usually thin walls, of medium size; germination often *in situ*, by means of a short promycelium which gives rise to a terminal group of elongate sporidia and these often bearing secondary and even tertiary groups.

Type, *Sclerotium Alismatis* Nees.

EUDOASSANSIA. Spore-balls within the cortex consisting entirely of spores.
- Sori forming scarcely thickened spots in leaves.
  - Cortical cells inconspicuous, 8–10μ. — 1. *D. Epilobii*.
  - Cortical cells conspicuous, 10–20μ in length.
    - Cortical cells oblong to cubical; spore-balls 100–160μ. — 2. *D. ranunculina*.
    - Cortical cells ovate to subspherical; spore-balls 100–125μ. — 3. *D. Sagittariae*.
    - Cortical cells radially elongate, chiefly oblong; spore-balls 120–180μ. — 4. *D. Alismatis*.
- Sori forming opaque pustules in leaves. — 5. *D. opaca*.

DOASSANSIOPSIS. Spore-balls within the cortex consisting of one or more layers of spores and a central mass of parenchymatous cells.
- Sori in ovaries. — 6. *D. occulta*.
- Sori in leaves.
  - Sori not causing distortion of tissues.
    - Spore-balls subspherical or spherical, 100–160μ. — 7. *D. Martianoffiana*.
    - Spore-balls ellipsoidal to spherical, 200–300μ. — 8. *D. intermedia*.
  - Sori causing conspicuous distortion of tissues. — 9. *D. deformans*.

PSEUDODOASSANSIA. Spore-balls within the cortex consisting of several layers of spores and a central mass of interwoven hyphae. — 10. *D. obscura*.

1. Doassansia Epilobii Farl. Bot. Gaz. 8: 277. 1883.

Sori in leaves, thin, forming at first yellowish but later dark-brown spots in which the aggregated spore-balls show as minute darker-colored elevations; spore-balls situated in the spongy parenchymatous tissue, usually clustered, consisting of a rather indefinite cortex and a spore-mass entirely filling the interior, ellipsoidal to irregularly spherical, 120–220μ in length; cortical cells dark-brown, irregularly polyhedral or flattened radially, with thick walls, small, 8–10μ in length; spores light-brownish, broadly ellipsoidal to irregularly polyhedral or subspherical, with smooth moderately thick walls, chiefly 8–12μ in length.

ON ONAGRACEAE:
Epilobium alpinum, New Hampshire.
TYPE LOCALITY: White Mountains (King's Ravine), New Hampshire, on *Epilobium alpinum*.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Ann. Bot. 6: *pl. 2, f. 66*.
EXSICCATI: Ellis, N. Am. Fungi *1486*.

2. Doassansia ranunculina Davis, Bot. Gaz. 19: 416. 1894.

Sori in leaves, thin, forming light-brown spots 2–4 mm. in diameter, with the spore-balls showing as numerous minute clustered papillae; spore-balls developed in both palisade-layer and spongy parenchyma, consisting entirely of fertile cells surrounded by a definite cortex, ovoid to spherical, about 100–160 μ in length; cortical cells reddish-brown, polyhedral or cubical to oblong, often irregular, thin-walled, moderately prominent, chiefly 10–18 μ in length; spores hyaline to yellowish, chiefly subspherical or polyhedral, with thin smooth walls, about 10–14 μ in diameter.

ON RANUNCULACEAE:
Ranunculus delphinifolius (*R. multifidus*), Wisconsin.
TYPE LOCALITY: Racine, Wisconsin, on *Ranunculus multifidus* (*R. delphinifolius*).
DISTRIBUTION: Wisconsin.
EXSICCATI: Ellis & Ev. N. Am. Fungi *3238*; Ellis & Ev. Fungi Columb. *1531*; Sydow, Ust. *337*.

3. **Doassansia Sagittariae** (Westend.) Fisch, Ber. Deuts. Bot. Ges. **2**: 405. 1884.

Uredo Sagittariae Westend. Herb. Crypt. Belge *1177*. 1857.
Doassansia Sagittariae f. *confluens* Davis, Trans. Wisc. Acad. **14**: 92. 1903.

Sori in leaves, thin, showing as distinct or somewhat merged yellowish or reddish-brown areas in which the spore-balls form numerous very minute elevations; spore-balls situated in either palisade-layer or the spongy parenchyma, consisting of a distinct cortex with spore-mass entirely filling the interior, subspherical, about 100–125 μ in diameter; cortical cells light reddish-brown, ovate to subspherical or irregularly polyhedral, rather thin-walled, loosely adhering, prominent, 10–18 μ in length; spores loosely compacted, chiefly subspherical or polyhedral, with moderately thick smooth wall, chiefly 8–13 μ in diameter.

ON ALISMACEAE:
Sagittaria arifolia, Illinois.
Sagittaria graminea, Delaware, Illinois.
Sagittaria latifolia (*S. variabilis*), Kansas, Missouri, New York, Ohio, Wisconsin.
Sagittaria rigida (*S. heterophylla*), Wisconsin.
Sagittaria sp., Missouri, Vermont; Canada.
TYPE LOCALITY: Marbais, Belgium, on *Sagittaria sagittifolia*.
DISTRIBUTION: Vermont to Delaware, Wisconsin, and Kansas; Canada; also in South America and Europe.
ILLUSTRATIONS: Ann. Bot. **6**: *pl. 2, f. 71*; Brefeld, Unters. Gesammt. Myk. **12**: *pl. 12, f. 1–16*; Ber. Deuts. Bot. Ges. **2**: *pl. 10*.
EXSICCATI: Seym. & Earle, Econ. Fungi *C 14*, *C 15*; Rab.-Wint. Fungi Eur. *2902a*.

4. **Doassansia Alismatis** (Nees) Cornu, Ann. Sci. Nat. VI. **15**: 285. 1883.

Sclerotium Alismatis Nees; Fries, Syst. Myc. **2**: 257. 1822.
Entyloma Alismacearum Sacc. Michelia **2**: 44. 1880. (Type from France, on *Alisma Plantago*.)

Sori in leaves, thin, forming at first yellowish but eventually reddish-brown spots, subcircular or irregular, distinct (5–12 mm.) or irregularly confluent, with spore-balls showing as very minute chiefly epiphyllous elevations; spore-balls situated in both palisade-layer and spongy parenchyma, consisting of a very distinct cortex with spore-mass entirely filling the interior, chiefly spherical, 120–180 μ in diameter; cortical cells light-brown, usually radially elongate, rather uniform, prominent, 12–20 $\mu \times$ 4–10 μ; spores light-colored, loosely packed together, ellipsoidal to spherical or polyhedral, with rather thick smooth walls, chiefly 8–11 μ in length.

ON ALISMACEAE:
Alisma Plantago-aquatica (*A. Plantago*), California, Iowa, Kansas, Minnesota, Missouri, Nebraska, New York, Washington, Wisconsin.
TYPE LOCALITY: Europe, on *Alisma natans*.
DISTRIBUTION: New York to Washington and California; also in Europe and Asia.
ILLUSTRATIONS: Ann. Sci. Nat. VI. 15: *pl. 16, f. 1–4*; Ann. Bot. **6**: *pl. 1, f. 1, pl. 2, f. 68–70*; E. & P. Nat. Pfl. 1^{1**}: *22. f. 13A*; Brefeld, Unters. Gesammt. Myk. **11**: *pl. 11, f. 16–19*.
EXSICCATI: Ellis, N. Am. Fungi *1485*; Ellis & Ev. Fungi Columb. *476*; Sydow, Ust. *186*.

5. **Doassansia opaca** Setch. Proc. Am. Acad. **26**: 15. 1891.

Sori in leaves, forming evident opaque subcircular pustules about 2–5 mm. in diameter and showing elevations on both surfaces of the leaf, more or less scattered in yellowish or reddish-brown usually widely discolored areas; spore-balls closely compacted in a single layer occupying most of the space between the two layers of epidermis, consisting of a very distinct cortex and a mass of fertile cells entirely filling the interior, oblong to subspherical or cubical, 200–300 μ in greatest length; cortical cells reddish-brown, oblong or subcubical, very prominent, about 14–27 μ in length; spores rather loosely compacted, chiefly subspherical, with smooth walls, 10–15 μ in diameter.

ON ALISMACEAE:
Sagittaria latifolia (*S. variabilis*), Connecticut, Delaware, Illinois, Massachusetts, New York, Rhode Island.
TYPE LOCALITY: Newton, Massachusetts, on *Sagittaria variabilis* (*S. latifolia*).
DISTRIBUTION: New England to Delaware and Illinois.

ILLUSTRATIONS: Ann. Bot. 6: *pl. 2, f. 72–74;* Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 19, 22, 29.*
EXSICCATI: Rab.-Wint.-Paz. Fungi Eur. *3802;* Seym. & Earle, Econ. Fungi *C 12, C 13.*

6. **Doassansia occulta** (Hoffm.) Cornu; Farl. Trans. Ottawa Field Nat. Club **2**: 129. 1884.

Sclerotium occultum Hoffm. Ic. Anal. Fung. 67. 1863.
Doassansiopsis occulta Dietel, in E. & P. Nat. Pfl. 1[1]**: 21. 1897.

Sori in ovaries, causing them to become considerably swollen, ovate, olive-green to reddish-brown; spore-balls situated in the endocarp, consisting of a distinct cortex within which is a single layer of fertile cells surrounding a central mass of parenchymatous cells, ellipsoidal to spherical, often irregular, 100–160 μ in length; cortical cells polyhedral or more elongate tangentially, 8–10 μ in length; spores adhering rather firmly, about 10–12 μ in length.

ON ZANNICHELLIACEAE:
Potamogeton Nuttallii (*P. pennsylvanicus*), Connecticut, New York.
Potamogeton sp., Illinois, Kansas.
TYPE LOCALITY: Germany, on *Potamogeton* sp.
DISTRIBUTION: Connecticut, New York, Illinois, and Kansas; also in Europe.
ILLUSTRATIONS: Hoffm. *loc. cit. pl. 16 (3), f. 1–9;* Ann. Bot. 6: *pl. 1, f. 43–50, pl. 2, f. 79.*
EXSICCATI: Rab.-Wint.-Paz. Fungi Eur. *3801.*

Doassansia occulta Farlowii (Cornu) Setch. Proc. Am. Acad. **26**: 17. 1891. *Doassansia Farlowii* Cornu, Ann. Sci. Nat. VI. **15**: 287. 1883. Sori and spore-balls as in the species; cortical cells smaller; spores chiefly oblong, about 16 μ × 3–4 μ. ON ZANANICHELLICEAE: *Potamogeton natans*, Canada. *Potamogeton Nuttallii* (*P. pennsylvanicus*), Vermont. *Potamogeton perfoliatus Richardsonii* (*P. perfoliatus lanceolatus*), Canada. *Potamogeton pusillus*, Canada. *Potamogeton Vaseyi*, Canada. ILLUSTRATIONS: Ann Sci. Nat. VI. **15**: *pl. 16, f. 5, 6;* Ann. Bot. 6: *pl. 2, f. 78.*

7. **Doassansia Martianoffiana** (Thüm.) Schröt. Krypt. Fl. Schles. 3[1]: 287. 1887.

Protomyces Martianoffianus Thüm. Bull. Soc. Nat. Mosc. **53**[1]: 207. 1878.
Doassansiopsis Martianoffiana Dietel, in E. & P. Nat. Pfl. 1[1]**: 21. 1897.

Sori in leaves, thin, forming at first yellowish but eventually reddish-brown discolorations, distinct as small circular spots or more usually merged into indefinite areas often covering greater surface of leaf; spore-balls situated in the spongy parenchyma, consisting of a distinct cortex surrounding a single layer of fertile cells within which is a central mass of parenchymatous cells, subspherical or spherical, 100–160 μ in diameter; cortical cells brown, small, irregularly polyhedral or tangentially elongate, about 8–11 μ; spores slightly tinted, polyhedral or elongate radially, chiefly 10–16 μ in length.

ON ZANNICHELLIACEAE:
Potamogeton natans, Massachusetts.
Potamogeton sp., Connecticut, Illinois, New York, Washington, Wisconsin; Canada.
TYPE LOCALITY: Minusinsk, Siberia, on *Potamogeton natans.*
DISTRIBUTION: New England to Wisconsin and Illinois; Canada; also in Europe and Asia.
ILLUSTRATIONS: Ann. Bot. 6: *pl. 2, f. 80;* E. & P. Nat. Pfl. 1[1]**: 22, *f. 13CD.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *3239;* Ellis & Ev. Fungi Columb. *863;* Seym. & Earle, Econ. Fungi *C 9, C 10, C 11.*

8. **Doassansia intermedia** Setch. Bot. Gaz. **19**: 185. 1894.

Doassansia affinis Ellis & Dearness, Bull. Torrey Club **22**: 364. 1895. (Type from Canada, on *Sagittaria variabilis.*)

Sori in leaves, forming light-yellow to brownish subcircular spots, 5–12 mm. in diameter, with spore-balls showing as minute hypophyllous pustules; spore-balls situated in the spongy parenchyma, consisting of a cortex surrounding several layers of spores and a central mass of parenchymatous cells, ellipsoidal to spherical, 200–300 μ in length; cortical cells with dark-brown moderately thick walls, chiefly subspherical, cubical, or polyhedral, occasionally more elongate, of medium size, 9–14 μ in length; parenchymatous cells thin-walled, empty, about the size of the spores or slightly larger; spores adhering rather firmly, ellipsoidal to chiefly spherical, chiefly 8–11 μ in length.

ON ALISMACEAE:
Sagittaria latifolia (*S. variabilis*), Iowa, Minnesota, New Hampshire, Wisconsin; Canada.
TYPE LOCALITY: Shelburne, New Hampshire, on *Sagittaria variabilis* (*S. latifolia*).

DISTRIBUTION: New Hampshire to Minnesota and Iowa; Canada.
ILLUSTRATION: Bot. Gaz. 19: *pl. 18, f. 1.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *3341;* Ellis & Ev. Fungi Columb. *862.*

9. **Doassansia deformans** Setch. Proc. Am. Acad. **26**: 17. 1891.

Doassansiopsis deformans Dietel, in E. & P. Nat. Pfl. 1[1]**: 21. 1897.

Sori in various parts of the host, usually causing conspicuous distortions when in the petioles or midribs, sometimes even 2–3 cm. in width by 7–8 cm. in length; spore-balls filling intercellular spaces, consisting of a cortical layer surrounding a single layer of fertile cells and a central mass of parenchymatous cells, spherical, 100–140 μ in diameter; cortical cells polyhedral, occasionally slightly elongate tangentially, sometimes even triangular in cross-section, small, 4–6 $\mu \times$ 8–12 μ; parenchymatous cells thin-walled, without contents, chiefly larger than the spores, sometimes even 22 μ in length; spores ovoid to polyhedral, rather firmly united, with rather thin smooth walls, 8–12 μ, rarely 15 μ, in length.

ON ALISMACEAE:
Sagittaria latifolia (*S. variabilis*), Connecticut, Illinois, Massachussetts, Missouri, Rhode Island, South Dakota, Wisconsin; Canada.
Sagittaria sp., Florida, Texas.
TYPE LOCALITY: Norwich, Connecticut, on *Sagittaria variabilis* (*S. latifolia*).
DISTRIBUTION: New England to South Dakota, Florida and Texas; Canada.
ILLUSTRATION: Ann. Bot. 6: *pl. 1, f. 51–58, pl. 2, f. 81.*
EXSICCATI: Ellis & Ev. N. Am. Fungi *2705;* Ellis & Ev. Fungi Columb. *272;* Rab.-Wint.-Paz. Fungi Eur. *4002;* Seym. & Earle, Econ. Fungi *C 8.*

10. **Doassansia obscura** Setch. Proc. Am. Acad. **26**: 16. 1891.

Sori not evident, the spore-balls being produced in the interior of the basal parts of the petioles without special distortion or discoloration though evident upon rupture of the enclosing tissues; spore-balls arranged in single rows in the air-chambers, consisting of a distinct cortex surrounding several irregular layers of spores and a central mass of indefinite fungous hyphae, oblong to subspherical, large, 150–300 μ in length; cortical cells rather light-brown and thin-walled, ovoid to obovate or subcordate, conspicuous, 12–18 $\mu \times$ 8–12 μ; spores light-brown, chiefly subspherical, with thin smooth walls, about 8–12 μ in diameter.

ON ALISMACEAE:
Sagittaria latifolia (*S. variabilis*), Connecticut, Massachusetts.
TYPE LOCALITY: Norwich, Connecticut, on *Sagittaria variabilis* (*S. latifolia*).
DISTRIBUTION: Massachusetts and Connecticut.
ILLUSTRATION: Ann. Bot. 6: *pl. 1, f. 33–42, pl. 2, f. 75–77.*

EXCLUDED SPECIES

Doassansia Sintenisii Bres. Bot. Jahrb. **17**: 489. 1893. On *Cedrela odorata.* Probably insect work.

Doassansia Zizaniae Davis, Bot. Gaz. **26**: 353. 1898. On *Zizania aquatica.* Sclerotium of some fungus.

8. **TRACYA** Sydow, Hedwigia Beibl. **40**: 3. 1901.

Cornuella Setch. Proc. Am. Acad. 26: 19. My 1891. Not *Cornuella* Pierre. Ja 1891.

Sori in the leaves (fronds), permanently imbedded in the tissues; spore-balls conspicuous, without cortical layer, composed of a single layer of fertile cells enclosing a network of septate filaments; spores hyaline to yellowish, firmly united, of small to medium size; germination as in *Doassansia.*

Type, *Cornuella Lemnae* Setch.

1. **Tracya Lemnae** (Setch.) Sydow, Hedwigia Beibl. **40**: 3. 1901.

Cornuella Lemnae Setch. Proc. Am. Acad. 26: 19. 1891.

Sori in the languishing fronds, rather indefinite, showing the spore-balls as very minute clustered or scattered opaque bodies; spore-balls situated in the spongy parenchyma above the lower epidermis, consisting of a single layer of fertile cells within which is a loosely arranged network of brownish filaments, ellipsoidal to spherical, small, 50–100 μ in length;

spores yellowish, originating from ends of the filaments, firmly compacted, cubical, polyhedral or often more elongate radially, chiefly 10–12 μ in length.

ON LEMNACEAE:
Spirodela polyrhiza, Connecticut, Massachussetts, Rhode Island, Wisconsin.
TYPE LOCALITY: Cambridge (Glacialis Pond), Massachusetts, on *Spirodela polyrhiza*.
DISTRIBUTION: New England and Wisconsin.
ILLUSTRATIONS: Ann. Bot. 6: *pl. 1, f. 59–64, pl. 2, f. 82–83*; Bull. Conn. Geol. Nat. Hist. Surv. 5: *f. 20*.
EXSICCATI: Seym. &. Earle, Econ. Fungi *C 55*.

HOST-INDEX TO THE USTILAGINALES

Aconitum columbianum
Urocystis sorosporioides, 56
Actaea alba
Urocystis carcinodes, 55
Actaea arguta
Urocystis carcinodes. 55
Actaea sp.
Urocystis carcinodes, 55
Aegopogon cenchroides
Ustilago Aegopogonis, 17
Agropyron divergens
Urocystis Agropyri, 58
Agropyron occidentale
Tilletia Earlei, 50
Urocystis Agropyri, 58
Ustilago hypodytes, 5
Agropyron repens
Urocystis Agropyri, 58
Ustilago macrospora, 19
Agropyron spicatum
Ustilago macrospora, 19
Agropyron sp.
Ustilago macrospora, 19
Agrostis alba vulgaris
Entyloma crastophilum, 60
Ustilago striaeformis, 18
Alisma Plantago-aquatica
Doassansia Alismatis, 69
Allium Cepa
Urocystis Cepulae, 57
Allium nevadense
Urocystis Cepulae, 57
Alopecurus geniculatus
Entyloma speciosum, 60
Alsine borealis
Ustilago violacea, 21
Ambrosia artemisiaefolia
Entyloma compositarum, 62
Entyloma polysporum, 62
Ambrosia bidentata
Entyloma polysporum, 62
Ambrosia psilostachya
Entyloma compositarum, 62
Ambrosia trifida
Entyloma compositarum, 62
Entyloma polysporum, 62
Ambrosia sp.
Entyloma compositarum, 62
Ammophila arenaria
Ustilago striaeformis, 18
Ammophila arundinacea, see **A. arenaria**
Andropogon argenteus, see **A. argyraeus**
Andropogon argyraeus
Tolyposporella Brunkii, 43
Andropogon contortus, see **Heteropogon contortus**
Andropogon furcatus
Sorosporium provinciale, 39
Sphacelotheca Ischaemi, 27
Sphacelotheca occidentalis, 27
Andropogon glomeratus
Sorosporium Everhartii, 38
Sphacelotheca occidentalis, 27
Andropogon Hallii
Sphacelotheca occidentalis, 27
Andropogon hirtifolius pubiflorus
Sphacelotheca Andropogonis-hirtifolii, 28
Tolyposporella Brunkii, 43
Andropogon macrourus, see **A. glomeratus**
Andropogon perforatus
Tolyposporella Brunkii, 43
Andropogon provincialis, see **A. furcatus**
Andropogon saccharoides
Sphacelotheca Andropogonis-hirtifolii, 28
Sphacelotheca Ischaemi, 27
Tolyposporella Brunkii, 43
Andropogon saccharoides leucopogon
Tolyposporella Brunkii, 43
Andropogon scoparius, see **Schizachyrium scoparium**
Andropogon Torreyanus
Sphacelotheca Ischaemi, 27
Andropogon virginicus
Sorosporium Ellisii, 39
Sorosporium Everhartii, 38
Sphacelotheca Seymouriana, 25
Andropogon sp.
Sphacelotheca Ischaemi, 27
Sphacelotheca Seymouriana, 25
Anemone canadensis
Urocystis Anemones, 55
Anemone caroliniana
Urocystis Anemones, 55
Anemone decapetala
Urocystis Anemones, 55
Anemone nemorosa, see **A. quinquefolia**
Anemone patens Nuttalliana, see **Pulsatilla hirsutissima**
Anemone pennsylvanica, see **A. canadensis**
Anemone quinquefolia
Entyloma Ranunculi, 61
Urocystis Anemones, 55
Anemone virginiana
Urocystis Anemones, 55
Anemonella, see **Syndesmon**
Anthoxanthum odoratum
Tilletia Anthoxanthi, 48
Aquilegia flavescens
Urocystis sorosporioides, 56
Aquilegia leptocera
Urocystis sorosporioides, 56
Arenaria groenlandica
Ustilago violacea, 21
Arenaria lateriflora, see **Moehringia lateriflora**
Aristida arizonica
Sorosporium consanguineum, 37

Aristida basiramea
Sorosporium consanguineum, 37
Aristida dichotoma
Sorosporium Ellisii, 39
Aristida longiseta
Sorosporium consanguineum, 37
Aristida purpurascens
Sorosporium consanguineum, 37
Aristida purpurea, see **A. longiseta**
Aristida Rusbyi, see **A. arizonica**
Aristida Schiedeana
Sorosporium consanguineum, 37
Aristida sp.
Sorosporium consanguineum, 37
Arnica Chamissonis
Entyloma arnicale, 63
Arnica cordifolia
Entyloma arnicale, 63
Arnica latifolia
Entyloma arnicale, 63
Arrhenatherum avenaceum, see **A. elatius**
Arrhenatherum elatius
Ustilago perennans, 7
Aster cordifolius
Entyloma compositarum, 62
Aster Novi-Belgii
Entyloma compositarum, 62
Aster paniculatus
Entyloma compositarum, 62
Aster puniceus
Entyloma compositarum, 62
Aster sp.
Entyloma compositarum, 62
Astragalus bisulcatus
Thecaphora deformans, 41
Astragalus Drummondii
Thecaphora deformans, 41
Astragalus missouriensis
Thecaphora deformans, 41
Astragalus multiflorus, see **Homalobus tenellus**
Astragalus Nuttallianus
Thecaphora deformans, 41
Astragalus scopulorum
Thecaphora deformans, 41
Astragalus sp.
Thecaphora deformans, 41
Atheropogon curtipendulus
Ustilago Hieronymi, 13
Atragene occidentalis
Urocystis carcinodes, 55
Avena fatua
Ustilago Avenae, 7
Avena sativa
Ustilago Avenae, 7
Ustilago levis, 7

Bidens chrysanthemoides, see **B. laevis**
Bidens frondosa
Entyloma guaraniticum, 63
Bidens laevis
Entyloma compositarum, 62
Bidens leucantha
Entyloma guaraniticum, 63
Bigelovia, see **Isocoma**
Bistorta bistortoides
Sphacelotheca Hydropiperis borealis, 30
Ustilago Bistortarum, 24
Bistorta vivipara
Ustilago Bistortarum, 24
Ustilago Bistortarum inflorescentiae, 24
Boerhaavia sp.
Thecaphora tunicata, 42
Bouteloua aristidoides, see **Triathera aristidoides**
Bouteloua breviseta
Ustilago calcara, 6
Ustilago Hieronymi, 13
Bouteloua bromoides
Ustilago Hieronymi, 13
Bouteloua eriopoda
Ustilago Hieronymi, 13
Bouteloua Havardii
Ustilago Hieronymi, 13
Bouteloua hirsuta
Ustilago minor, 13
Bouteloua oligostachya
Ustilago Bouteloуae, 13
Ustilago Hieronymi, 13
Bouteloua polystachya
Ustilago Hieronymi, 13
Bouteloua racemosa, see **Atheropogon curtipendulus**
Bromus arvensis
Ustilago bromivora, 10
Bromus breviaristatus
Ustilago bromivora, 10
Bromus ciliatus
Urocystis Agropyri, 58
Ustilago bromivora, 10
Ustilago bromivora macrospora, 10
Bromus Hookerianus
Ustilago bromivora, 10
Bromus hordeaceus
Ustilago bromivora, 10
Bromus Kalmii
Ustilago bromivora, 10
Bromus marginatus
Ustilago bromivora, 10
Bromus mollis, see **B. hordeaceus**
Bromus polyanthus
Ustilago bromivora, 10
Bromus Pumpellianus
Ustilago bromivora, 10
Bromus racemosus
Ustilago bromivora, 10
Bromus Richardsoni
Ustilago bromivora, 10
Bromus secalinus
Ustilago bromivora, 10
Bromus vulgaris
Ustilago bromivora, 10
Bromus sp.
Urocystis Agropyri, 58
Ustilago bromivora, 10
Buchloe, see **Bulbilis**
Bulbilis dactyloides
Tilletia buchloeana, 51
Ustilago Buchloes, 14

Calamagrostis breviseta
Ustilago Calamagrostidis, 19
Calamagrostis canadensis
Urocystis Agropyri, 58
Ustilago Calamagrostidis, 19
Calamagrostis Pickeringii, see **C. breviseta**
Calandrinia Breweri
Ustilago Calandriniae, 22
Calandrinia Menziesii
Ustilago Calandriniae, 22
Carduus leiocephalus
Thecaphora Trailii, 41
Carduus ochrocentrus
Thecaphora Trailii, 41
Carex abacta
Cintractia subinclusa, 32
Carex adusta
Thecaphora aterrima, 43
Carex altocaulis
Cintractia Caricis, 33
Carex arctata
Cintractia Caricis, 33
Carex atrata, see **C. atratiformis**
Carex atratiformis
Schizonella melanogramma, 36
Carex Bigelovii
Cintractia Caricis, 33
Carex Buxbaumii
Cintractia Caricis, 33
Carex canescens
Cintractia Caricis, 33
Carex cladostachya
Ustilago olivacea, 12
Carex crinita
Cintractia Caricis, 33
Carex dioica, see **C. Redowskyana**
Carex Douglasii
Cintractia Caricis, 33
Carex echinata, see **C. sterilis**
Carex elynoides
Cintractia Caricis, 33
Carex exilis
Cintractia Caricis, 33
Carex festiva
Cintractia Caricis, 33
Carex filifolia
Cintractia Caricis, 33
Cintractia externa, 34
Carex folliculata australis
Cintractia Caricis, 33
Ustilago olivacea, 12
Carex fusca, see **C. Buxbaumii**
Carex glareosa
Cintractia Caricis, 33
Carex Gmelini
Cintractia Caricis, 33
Carex Goodenovii
Cintractia Caricis, 33
Carex Hoodii
Schizonella melanogramma, 36
Carex incurva
Cintractia Caricis, 33
Carex invisa
Cintractia Caricis, 33
Carex lagopina
Cintractia Caricis, 33
Carex lanuginosa
Cintractia subinclusa, 32
Carex laxiflora
Schizonella melanogramma, 36
Carex limosa
Cintractia Caricis, 33
Carex livida
Cintractia Caricis, 33
Carex lupulina
Cintractia subinclusa, 32
Carex luzulaefolia
Cintractia Caricis, 33
Carex magellanica
Cintractia Caricis, 33
Carex marcida
Cintractia Caricis, 33
Carex Michauxiana, see **C. abacta**
Carex monile
Cintractia Caricis, 33
Carex nardina
Cintractia Caricis, 33
Carex nigricans
Cintractia Caricis, 33
Carex obnupta
Cintractia Caricis, 33
Carex occidentalis
Cintractia Caricis, 33
Carex oligosperma
Cintractia Caricis, 33
Cintractia subinclusa, 32
Carex pedunculata
Cintractia Caricis, 33
Carex pennsylvanica
Cintractia Caricis, 33
Schizonella melanogramma, 36
Thecaphora aterrima, 43
Carex polystachya, see **C. cladostachya**
Carex pseudoscirpoidea
Cintractia Caricis, 33
Carex Redowskyana
Cintractia Caricis, 33
Carex rigida
Cintractia Caricis, 33
Entyloma caricinum, 61
Carex rupestris
Cintractia Caricis, 33
Carex salina
Cintractia Caricis, 33
Carex scirpoidea
Cintractia Caricis, 33
Carex siccata
Cintractia Caricis, 33
Carex sitchensis
Cintractia Caricis, 33
Carex sterilis
Cintractia Caricis, 33
Carex straminiformis
Cintractia Caricis, 33
Carex stricta
Cintractia Caricis, 33
Carex tetanica
Cintractia Caricis, 33

Carex trichocarpa Deweyi
Cintractia subinclusa, 32
Carex turfosa, see **C. Goodenovii**
Carex turgescens
Ustilago olivacea, 12
Carex umbellata
Cintractia Caricis, 33
Carex utriculata
Cintractia Caricis, 33
Cintractia subinclusa, 32
Ustilago olivacea, 12
Carex vaginata, see **C. altocaulis**
Carex varia
Cintractia Caricis, 33
Carex variabilis
Cintractia Caricis, 33
Carex vulgaris hyperborea, see **C. Bigelovii**
Carex sp.
Cintractia Caricis, 33
Cintractia subinclusa, 32
Schizonella melanogramma, 36
Thecaphora aterrima, 43
Ustilago olivacea, 12
Castalia odorata
Entyloma Nymphaeae, 66
Castalia tuberosa
Entyloma Nymphaeae, 66
Castalia sp.
Entyloma Nymphaeae, 66
Catabrosa aquatica
Entyloma crastophilum, 60
Cathestecum prostratum
Tilletia Cathesteci, 51
Cenchrus echinatus
Sorosporium Syntherismae, 38
Cenchrus multiflorus
Sorosporium Syntherismae, 38
Cenchrus tribuloides
Sorosporium Syntherismae, 38
Cenchrus sp.
Sorosporium Syntherismae, 38
Cerastium maximum
Ustilago violacea, 21
Chaetochloa glauca
Ustilago neglecta, 16
Chaetochloa imberbis
Spacelotheca pamparum, 27
Chaetochloa italica
Ustilago Crameri, 10
Chaetochloa sp.
Sphacelotheca pamparum, 27
Chloris elegans
Ustilago elegans, 18
Chloris submutica
Ustilago Ulei, 11
Chloris sp.
Ustilago chloridicola, 11
Chrysopogon, see **Sorghastrum**
Cimicifuga racemosa
Urocystis carcinodes, 55
Cirsium, see **Carduus**
Cissus acida
Mykosyrinx Cissi, 37
Cissus erosa
Mykosyrinx Cissi, 37
Cissus sicyoides
Mykosyrinx Cissi, 37
Cissus sp.
Mykosyrinx Cissi, 37
Cladothrix lanuginosa
Thecaphora Thornberi, 42
Cnicus, see **Carduus**
Collinsia bartsiaefolia
Entyloma Collinsiae, 63
Cosmos sulphureus
Entyloma Holwayi, 62
Cyperus filiculmis
Cintractia Cyperi, 32
Cyperus Grayii
Cintractia axicola minor, 35
Cyperus ligularis
Cintractia limitata, 32
Cyperus sphacelatus
Cintractia axicola minor, 35
Cyrtorhyncha ranunculina
Urocystis Anemones, 55

Dactyloctenium aegyptium
Ustilago sparsa, 12
Danthonia californica
Ustilago residua, 9
Danthonia compressa
Ustilago residua, 9
Danthonia intermedia
Ustilago residua, 9
Danthonia spicata
Ustilago residua, 9
Danthonia unispicata
Ustilago residua, 9
Danthonia sp.
Ustilago residua, 9
Dasyochloa pulchella
Ustilago Hieronymi, 13
Delphinium scopulorum
Urocystis sorosporioides, 56
Delphinium sp.
Urocystis sorosporioides, 56
Dendromecon sp.
Entyloma Eschscholtziae, 65
Deschampsia caespitosa
Tilletia cerebrina, 49
Deschampsia calycina
Tilletia Airae, 49
Desmodium, see **Meibomia**
Distichlis maritima, see **D. spicata**
Distichlis spicata
Ustilago hypodytes, 5

Echinochloa colona
Ustilago sphaerogena, 14
Echinochloa Crus-galli
Sphacelotheca diplospora, 26
Tolyposporium bullatum, 44
Ustilago Crus-galli, 14
Ustilago sphaerogena, 14
Echinochloa Walteri
Ustilago Crus-galli, 14
Ustilago sphaerogena, 14

Echinodorus cordifolius
Burrillia Echinodori, 67
Echinodorus rostratus, see **E. cordifolius**
Elymus arenarius
Urocystis Agropyri, 58
Elymus canadensis
Urocystis Agropyri, 68
Ustilago hypodytes, 5
Elymus canadensis glaucifolius
Ustilago striaeformis, 18
Elymus condensatus
Ustilago hypodytes, 5
Elymus glaucus
Tilletia Elymi, 48
Ustilago hypodytes, 5
Elymus robustus
Urocystis Agropyri, 58
Ustilago striaeformis, 18
Elymus striatus
Ustilago hypodytes, 5
Elymus virginicus
Urocystis Agropyri, 58
Ustilago striaeformis, 18
Elymus sp.
Tilletia Elymi, 48
Urocystis Agropyri, 58
Ustilago macrospora, 19
Elyna Bellardi
Cintractia Caricis, 33
Epilobium alpinum
Doassansia Epilobii, 68
Eragrostis glomerata
Tilletia Eragrostidis, 53
Eragrostis hypnoides
Ustilago spermophora, 12
Eragrostis major
Ustilago spermophora, 12
Eragrostis neo-mexicana
Sphacelotheca strangulans, 29
Eragrostis reptans, see **E. hypnoides**
Erigeron elatus
Entyloma compositarum, 62
Erigeron philadelphicus
Entyloma compositarum, 62
Erigeron salsuginosus
Entyloma compositarum, 62
Eriocaulon septangulare
Tolyposporium Eriocauli, 45
Ustilago Eriocauli, 16
Eriochloa, see **Monachne**
Eriocoma cuspidata
Ustilago hypodytes, 5
Ustilago minima, 5
Eryngium aquaticum
Entyloma Eryngii, 65
Eryngium yuccaefolium, see **E. aquaticum**
Erythronium americanum
Ustilago Heufleri, 20
Eschscholtzia californica
Entyloma Eschscholtziae, 65
Euchlaena luxurians
Ustilago Kellermanii, 15
Ustilago Zeae, 15
Eupatorium ageratoides
Entyloma compositarum, 62

Festuca microstachya
Tilletia fusca, 49
Ustilago Mulfordiana, 18
Festuca nutans
Ustilago striaeformis, 18
Festuca octoflora
Tilletia fusca, 49
Ustilago Mulfordiana, 18
Festuca tenella, see **F. octoflora**
Festuca sp.
Ustilago Mulfordiana, 18
Fimbristylis autumnalis
Cintractia axicola, 35
Fimbristylis diphylla
Cintractia axicola, 35
Fimbristylis Holwayana
Cintractia axicola, 35
Fimbristylis sp.
Cintractia axicola, 35
Floerkea proserpinacoides
Entyloma Floerkeae, 63

Gaillardia pulchella
Entyloma polysporum, 62
Gayophytum caesium
Ustilago Gayophyti, 21
Gayophytum lasiospermum
Ustilago Gayophyti, 21
Gayophytum ramosissimum
Ustilago Gayophyti, 21
Geum ciliatum, see **Sieversia ciliata**
Glyceria, see **Panicularia**
Gnaphalium sp.
Entyloma compositarum, 62
Grindelia robusta
Thecaphora californica, 41
Grindelia squarrosa
Thecaphora cuneata, 41
Guardiola platyphylla
Thecaphora mexicana, 42

Helenium autumnale
Entyloma compositarum, 62
Helianthus annuus
Entyloma polysporum, 62
Hepatica acuta
Urocystis Anemones, 55
Hepatica acutiloba, see **H. acuta**
Hepatica Hepatica
Urocystis Anemones, 55
Hepatica triloba, see **H. Hepatica**
Heteropogon acuminatus, see **H. melanocarpus**
Heteropogon contortus
Sorosporium contortum, 38
Sphacelotheca Ischaemi, 27
Sphacelotheca monilifera, 26
Heteropogon melanocarpus
Sphacelotheca Nealii, 29
Heterotheca Lamarckii, see **H. subaxillaris**
Heterotheca subaxillaris
Entyloma compositarum, 62
Hilaria cenchroides
Ustilago Aegopogonis, 17

Ustilago affinis, 9
Hilaria Jamesii
Ustilago Hilariae, 18
Hilaria mutica
Ustilago Hilariae, 18
Holcus lanatus
Entyloma crastophilum, 60
Homalobus tenellus
Thecaphora deformans, 41
Homalocenchrus hexandrus
Tolyposporium globuligerum, 44
Homalocenchrus lenticularis
Tilletia corona, 52
Homalocenchrus oryzoides
Tilletia corona, 52
Homalocenchrus virginicus
Tilletia corona, 52
Hordeum caespitosum
Ustilago Lorentziana, 9
Hordeum jubatum
Ustilago Lorentziana, 9
Hordeum maritimum
Ustilago Lorentziana, 9
Hordeum murinum
Ustilago Lorentziana, 9
Hordeum nodosum
Tilletia texana, 51
Ustilago Lorentziana, 9
Hordeum pratense, see **H. nodosum**
Hordeum pusillum
Ustilago Lorentziana, 9
Hordeum sp.
Ustilago Hordei, 6
Ustilago Lorentziana, 9
Ustilago nuda, 8
Hosackia parviflora, see **Lotus micranthus**
Hypoxis erecta, see **H. hirsuta**
Hypoxis hirsuta
Urocystis Hypoxyis, 59

Isocoma veneta
Thecaphora pilulaeformis, 40
Isocoma sp.
Thecaphora pilulaeformis, 40
Juncoides campestre
Cintractia Luzulae, 34
Juncus acuminatus
Cintractia Junci, 34
Juncus balticus
Urocystis Junci, 58
Juncus effusus
Cintractia Junci, 34
Juncus tenuis
Cintractia Junci, 34
Juncus sp.
Cintractia Junci, 34

Kobresia bipartita
Cintractia Caricis, 33
Kobresia caricina, see **K. bipartita**
Kobresia scirpina, see **Elyna Bellardi**
Koenigia, see **Macounastrum**

Lactuca canadensis
Entyloma compositarum, 62
Leersia, see **Homalocenchrus**
Lepachys, see **Ratibida**
Leptochloa mucronata
Ustilago ornata, 16
Leptochloa scabra
Ustilago heterogena, 15
Limnanthemum lacunosum
Burrillia decipiens, 67
Linaria Linaria
Entyloma Linariae, 65
Linaria vulgaris, see **L. Linaria**
Lithophragma bulbifera
Urocystis Lithophragmae, 56
Lobelia inflata
Entyloma Lobeliae, 64
Lobelia sp.
Entyloma Lobeliae, 64
Lotus humistratus
Thecaphora deformans, 41
Lotus micranthus
Thecaphora deformans, 41
Lupinus sp.
Thecaphora deformans, 41
Luzula, see **Juncoides**
Lychnis sp.
Ustilago violacea, 21
Lycurus phleoides
Ustilago lycuroides, 10

Macounastrum islandicum
Ustilago Koenigiae, 23
Meibomia grandiflora
Thecaphora deformans, 41
Meibomia nudiflora
Thecaphora deformans, 41
Menispermum canadense
Entyloma Menispermi, 61
Mertensia virginica
Entyloma serotinum, 64
Moehringia lateriflora
Ustilago violacea, 21
Monachne punctata
Sorosporium Eriochloae, 38
Muhlenbergia glomerata, see **M. racemosa**
Muhlenbergia Porteri
Ustilago Muhlenbergiae, 8
Muhlenbergia Pringlei
Ustilago Muhlenbergiae, 8
Muhlenbergia racemosa
Sphacelotheca montaniensis, 29
Muhlenbergia Schaffneri elongata
Tilletia Muhlenbergiae, 49
Muhlenbergia texana, see **M. Porteri**
Muhlenbergia sp.
Sphacelotheca montaniensis, 29
Ustilago mexicana, 6

Nolina microcarpa
Tolyposporella Nolinae, 44
Nuphar advena, see **Nymphaea advena**
Nymphaea advena
Entyloma Nymphaeae, 66
Nymphaea odorata, see **Castalia odorata**
Nymphaea reniformis, see **Castalia tuberosa**

Oryza sativa
Tilletia horrida, 52

Oryzopsis, see **Eriocoma**
Oxalis stricta
Ustilago Oxalidis, 20
Oxyria digyna
Ustilago vinosa, 21
Oxyria sp.
Ustilago vinosa, 21

Panicularia americana
Ustilago Arthurii, 20
Ustilago longissima, 6
Panicularia fluitans
Ustilago longissima macrospora, 6
Panicularia laxa
Ustilago longissima macrospora, 6
Panicularia sp.
Ustilago longissima, 6
Panicum agrostoides
Sorosporium Syntherismae, 38
Panicum capillare
Sorosporium Syntherismae, 38
Panicum colonum, see **Echinochloa colona**
Panicum Crus-galli, see **Echinochloa Crus-galli**
Panicum filiforme, see **Syntherisma filiforme**
Panicum fimbriatum, see **Syntherisma fimbriatum**
Panicum glabrum, see **Syntherisma humifusum**
Panicum hirticaulum
Sorosporium Syntherismae, 38
Panicum leucophaeum, see **Trichachne insulare**
Panicum obtusum
Tilletia pulcherrima, 52
Panicum paspaloides
Ustilago Panici-proliferi, 11
Ustilago Rickerii, 11
Panicum proliferum
Entyloma speciosum, 60
Sorosporium Syntherismae, 38
Ustilago pustulata, 14
Panicum proliferum acuminatum
Ustilago Panici-proliferi, 11
Panicum rottboellioides
Sphacelotheca diplospora glabra, 27
Panicum saccharatum, see **Trichachne saccharatum**
Panicum sanguinale, see **Syntherisma sanguinale**
Panicum virgatum
Tilletia Maclagani, 50
Tilletia pulcherrima, 52
Ustilago pustulata, 14
Panicum Walteri, see **Echinochloa Walteri**
Panicum sp.
Entyloma speciosum, 60
Sorosporium Syntherismae, 38
Sphacelotheca diplospora verruculosa, 27
Papaver sp.
Entyloma fuscum, 66
Pappophorum Wrightii
Ustilago Hieronymi, 13
Paspalum notatum
Sphacelotheca Paspali-notati, 28
Paspalum plicatulum
Tilletia rugispora, 52
Paspalum velutinum
Ustilago Holwayana, 17
Paspalum sp.
Tilletia rugispora, 52
Persicaria amphibia
Ustilago utriculosa, 22
Persicaria Careyi
Ustilago utriculosa, 22
Persicaria Hydropiper
Melanopsichium austro-americanum, 30
Sphacelotheca Hydropiperis, 30
Ustilago utriculosa, 22
Persicaria hydropiperoides
Ustilago utriculosa, 22
Persicaria incarnata
Melanopsichium austro-americanum, 30
Ustilago utriculosa, 22
Persicaria lapathifolia
Melanopsichium austro-americanum, 30
Ustilago utriculosa, 22
Persicaria pennsylvanica
Melanopsichium austro-americanum, 30
Ustilago utriculosa, 22
Persicaria Persicaria
Sphacelotheca Hydropiperis, 30
Persicaria punctata
Sphacelotheca Hydropiperis, 30
Ustilago utriculosa, 22
Persicaria sp.
Melanopsichium austro-americanum, 30
Sphacelotheca Hydropiperis, 30
Ustilago utriculosa, 22
Phalaris arundinacea
Ustilago echinata, 20
Phleum pratense
Entyloma crastophilum, 60
Ustilago striaeformis, 18
Phragmites communis, see **P. Phragmites**
Phragmites Phragmites
Neovossia iowensis, 53
Physalis angulata
Entyloma australe, 64
Physalis heterophylla
Entyloma australe, 64
Physalis lanceolata
Entyloma australe, 64
Physalis lanceolata laevigata, see **P. longifolia**
Physalis longifolia
Entyloma australe, 64
Physalis philadelphica
Entyloma australe, 64
Physalis pubescens
Entyloma australe, 64
Physalis virginiana
Entyloma australe, 64
Physalis sp.
Entyloma australe, 64
Poa annua
Ustilago striaeformis, 18
Poa Buckleyana
Ustilago hypodytes, 5
Poa debilis
Ustilago striaeformis, 18
Poa megastachya, see **Eragrostis major**
Poa pratensis
Entyloma irregulare, 60

Ustilago striaeformis, 18
Polygonatum, see **Salomonia**
Polygonum acre, see **Persicaria punctata**
Polygonum amphibium, see **Persicaria amphibia**
Polygonum aviculare
Melanopsichium austro-americanum, 30
Ustilago utriculosa, 22
Polygonum bistortoides, see **Bistorta bistortoides**
Polygonum Careyi, see **Persicaria Careyi**
Polygonum cilinode, see **Tiniaria cilinodis**
Polygonum Convolvulus, see **Tiniaria Convolvulus**
Polygonum Davisiae
Ustilago Piperii, 23
Polygonum dumetorum scandens, see **Tiniaria scandens**
Polygonum erectum
Ustilago utriculosa, 22
Polygonum Hydropiper, see **Persicaria Hydropiper**
Polygonum hydropiperoides, see **Persicaria hydropiperoides**
Polygonum incarnatum, see **Persicaria incarnata**
Polygonum lapathifolium, see **Persicaria lapathifolia**
Polygonum lapathifolium incarnatum, see **Persicaria incarnata**
Polygonum Newberrii
Ustilago punctata, 23
Polygonum pennsylvanicum, see **Persicaria pennsylvanica**
Polygonum Persicaria, see **Persicaria Persicaria**
Polygonum phytolaccaefolium
Ustilago Piperii, 23
Polygonum punctatum, see **Persicaria punctata**
Polygonum sagittatum, see **Tracaulon sagittatum**
Polygonum scandens, see **Tiniaria scandens**
Polygonum virginianum, see **Tovara virginiana**
Polygonum viviparum, see **Bistorta vivipara**
Potamogeton natans
Doassansia Martianoffiana, 70
Doassansia occulta Farlowii, 70
Potamogeton Nuttallii
Doassansia occulta, 70
Doassansia occulta Farlowii, 70
Potamogeton pennsylvanicus, see **P. Nuttallii**
Potamogeton perfoliatus Richardsonii
Doassansia occulta Farlowii, 70
Potamogeton pusillus
Doassansia occulta Farlowii, 70
Potamogeton Vaseyi
Doassansia occulta Farlowii, 70
Potamogeton sp.
Doassansia Martianoffiana, 70
Doassansia occulta, 70
Psilocarya nitens
Cintractia Psilocaryae, 32
Psilocarya scirpoides
Cintractia Psilocaryae, 32
Puccinellia airoides
Ustilago hypodytes, 5
Pulsatilla hirsutissima
Urocystis Anemones, 55

Ranunculus delphinifolius
Doassansia ranunculina, 68
Ranunculus digitatus
Urocystis Anemones, 55
Ranunculus eremogenes
Entyloma Ranunculi, 61
Ranunculus Eschscholtzii
Urocystis Anemones, 55
Ranunculus fascicularis
Entyloma microsporum, 66
Urocystis Anemones, 55
Ranunculus multifidus, see **R. delphinifolius**
Ranunculus pennsylvanicus
Entyloma Ranunculi, 61
Ranunculus pygmaeus
Entyloma microsporum pygmaeum, 66
Ranunculus septentrionalis
Entyloma microsporum, 66
Ranunculus stenolobus
Urocystis Anemones, 55
Ranunculus sp.
Entyloma microsporum, 66
Urocystis Anemones, 55
Ratibida pinnata
Entyloma compositarum, 62
Redfieldia flexuosa
Tilletia Redfieldiae, 50
Rhynchospora, see **Rynchospora**
Rudbeckia laciniata
Entyloma compositarum, 62
Rumex Acetosella
Ustilago Rumicis, 23
Rumex altissimus
Ustilago Parlatorei, 23
Rumex Brittanica
Ustilago Parlatorei, 23
Rumex hastatulus
Ustilago Rumicis, 23
Rumex mexicanus
Ustilago Parlatorei, 23
Rynchospora alba
Cintractia Montagnei, 31
Cintractia Taubertiana, 32
Rynchospora aurea, see **R. corymbosa**
Rynchospora axillaris
Cintractia Taubertiana, 32
Rynchospora cephalantha, see **R. axillaris**
Rynchospora ciliata
Cintractia Montagnei, 31
Rynchospora corniculata
Cintractia leucoderma, 35
Rynchospora corniculata macrostachya
Cintractia leucoderma, 35
Testicularia Cyperi, 45
Rynchospora corymbosa
Cintractia utriculicola, 35
Rynchospora cymosa
Cintractia Taubertiana, 32
Rynchospora eximia
Cintractia Montagnei, 31
Rynchospora fascicularis
Cintractia Taubertiana, 32
Rynchospora gigantea
Cintractia leucoderma, 35
Rynchospora glomerata
Cintractia Montagnei, 31

Rynchospora inexpansa
Cintractia Taubertiana, 32
Rynchospora macrostachya, see **R. corniculata macrostachya**
Rynchospora semiplumosa
Sorosporium Rhynchosporae, 40
Rynchospora tenuis
Cintractia Montagnei, 31
Rynchospora Tracyi
Cintractia leucoderma, 35
Rynchospora sp.
Cintractia leucoderma, 35
Cintractia Montagnei, 31
Cintractia Taubertiana, 32
Cintractia utriculicola, 35

Sagittaria arifolia
Doassansia Sagittariae, 69
Sagittaria graminea
Doassansia Sagittariae, 69
Sagittaria heterophylla, see **S. rigida**
Sagittaria latifolia
Burrillia pustulata, 67
Doassansia deformans, 71
Doassansia intermedia, 70
Doassansia obscura, 71
Doassansia opaca, 69
Doassansia Sagittariae, 69
Sagittaria rigida
Doassansia Sagittariae, 69
Sagittaria variabilis, see **S. latifolia**
Sagittaria sp.
Doassansia deformans, 71
Doassansia Sagittariae, 69
Salomonia commutata
Urocystis Colchici, 57
Sanicula marylandica
Entyloma Saniculae, 64
Sanicula Menziesii
Entyloma Saniculae, 64
Sanicula sp.
Entyloma Saniculae, 64
Schizachyrium scoparium
Sorosporium Ellisii, 39
Sorosporium Everhartii, 38
Sphacelotheca Ischaemi, 27
Scilla praecox
Ustilago Vaillantii, 20
Scirpus caespitosus
Cintractia Caricis, 33
Scolochloa festucacea
Ustilago Arthurii, 20
Secale cereale
Urocystis occulta, 57
Senecio aureus
Entyloma compositarum, 62
Senecio Balsamitae
Entyloma compositarum, 62
Setaria, see **Chaetochloa**
Sieglingia, see **Triplasis**
Sieversia ciliata
Urocystis Waldsteiniae, 55
Silene acaulis
Ustilago violacea, 21
Silene Douglasii Macounii, see **S. Lyallii**
Silene Lyallii
Ustilago violacea, 21
Silene multicaulis
Ustilago violacea, 21
Silene tetonensis
Ustilago violacea, 21
Silene Watsoni
Ustilago violacea, 21
Ustilago violacea major, 21
Silphium integrifolium
Entyloma compositarum, 62
Sitanion longifolium
Ustilago hypodytes, 5
Ustilago striaeformis, 18
Smilacina, see **Vagnera**
Solanum nigrum
Entyloma australe, 74
Solanum triflorum
Entyloma australe, 64
Solanum sp.
Entyloma australe, 64
Solidago missouriensis
Thecaphora cuneata, 41
Sorghastrum avenaceum
Tolyposporella Chrysopogonis, 43
Sorghastrum nutans
Sphacelotheca Chrysopogonis, 26
Tolyposporella Chrysopogonis, 43
Sorghum halepense
Sphacelotheca Sorghi, 25
Sorghum vulgare
Sphacelotheca Reiliana, 29
Sphacelotheca Sorghi, 25
Spinacia oleracea
Entyloma Ellisii, 65
Spirodela polyrhiza
Tracya Lemnae, 71
Sporobolus asperifolius
Tilletia asperifolia, 50
Sporobolus cryptandrus
Ustilago hypodytes, 5
Sporobolus ejuncidus
Ustilago Sporoboli, 16
Sporobolus gracillimus
Tilletia montana, 49
Sporobolus junceus, see **S. ejuncidus**
Sporobolus neglectus
Ustilago Vilfae, 17
Sporobolus simplex
Tilletia montana, 49
Sporobolus vaginaeflorus
Ustilago Vilfae, 17
Sporobolus sp.
Ustilago hypodytes, 5
Stellaria, see **Alsine**
Stenotaphrum americanum, see **S. secundatum**
Stenotaphrum secundatum
Ustilago affinis, 9
Stipa comata
Sorosporium granulosum, 39
Urocystis granulosa, 58
Ustilago hypodytes, 5

Stipa coronata
Ustilago hypodytes, 5
Stipa eminens
Ustilago hypodytes, 5
Stipa eminens Andersoni
Tilletia Wilcoxiana, 51
Stipa occidentalis
Ustilago hypodytes, 5
Stipa Richardsonii
Ustilago hypodytes, 5
Stipa setigera
Ustilago hypodytes, 5
Stipa spartea
Ustilago hypodytes, 5
Ustilago minima, 5
Stipa Vaseyi
Ustilago hypodytes, 5
Stipa viridula
Sorosporium granulosum, 39
Ustilago hypodytes, 5
Stipa sp.
Ustilago hypodytes, 5
Streptopus roseus
Tuburcinia Clintoniae, 54
Syndesmon thalictroides
Urocystis Anemones, 55
Syntherisma filiforme
Ustilago Rabenhorstiana, 17
Syntherisma fimbriatum
Ustilago Rabenhorstiana, 17
Syntherisma humifusum
Ustilago Rabenhorstiana, 17
Syntherisma sanguinale
Sphacelotheca diplospora, 26
Tilletia pulcherrima, 52
Ustilago Rabenhorstiana, 17
Syntherisma sp.
Ustilago Rabenhorstiana, 17

Thalictrum alpinum
Urocystis sorosporioides, 56
Thalictrum dioicum
Entyloma Thalictri, 61
Thalictrum Fendleri
Urocystis sorosporioides, 56
Thalictrum polygamum
Entyloma Thalictri, 61
Thalictrum purpurascens
Entyloma Thalictri, 61
Thalictrum sparsiflorum
Urocystis sorosporioides, 56
Thalictrum sp.
Urocystis sorosporioides, 56
Tillandsia Leiboldiana
Ustilago Tillandsiae, 11
Tillandsia sp.
Ustilago Tillandsiae, 11
Tiniaria cilinodis
Ustilago anomala, 22
Tiniaria Convolvulus
Ustilago anomala, 22
Tiniaria scandens
Ustilago anomala, 22
Tovara virginiana
Melanopsichium austro-americanum, 30
Tracaulon sagittatum
Sphacelotheca Hydropiperis, 30
Ustilago utriculosa, 22
Triathera aristidoides
Ustilago Hieronymi, 13
Trichachne insulare
Sphacelotheca Panici-leucophaei, 28
Trichachne saccharatum
Sphacelotheca Panici-leucophaei, 28
Tricuspis, see **Tridens**
Tridens seslerioides
Ustilago Tricuspidis, 13
Trientalis arctica
Tuburcinia Trientalis, 54
Trifolium tridentatum
Thecaphora deformans, 41
Triodia cuprea, see **Tridens seslerioides**
Triodia pulchella, see **Dasyochloa pulchella**
Triplasis americana
Ustilago Triplasidis, 12
Triplasis purpurea
Ustilago Sieglingiae, 12
Tripsacum dactyloides
Ustilago Dieteliana, 18
Triticum vulgare
Tilletia foetens, 48
Tilletia Tritici, 48
Ustilago Tritici, 8
Trollius sp.
Urocystis Anemones, 55

Uniola gracilis, see **U. laxa**
Uniola laxa
Ustilago Uniolae, 16

Vagnera amplexicaulis
Urocystis Colchici, 57
Vagnera stellata
Tuburcinia Clintoniae, 54
Urocystis Colchici, 57
Veronica americana
Entyloma Linariae Veronicae, 65
Veronica peregrina
Entyloma Linariae Veronicae, 65
Vicia americana
Thecaphora deformans, 41
Vicia caroliniana
Thecaphora deformans, 41
Vilfa vaginaeflora, see **Sporobolus vaginaeflorus**
Viola odorata
Urocystis Violae, 56
Viola sp.
Urocystis Violae, 56

Waldsteinia fragarioides
Urocystis Waldsteiniae, 55

Zea Mays
Sphacelotheca Reiliana, 29
Ustilago Zeae, 15
Zizania aquatica
Entyloma lineatum, 60

ADDITIONS AND CORRECTIONS TO USTILAGINALES

By George Lorenzo Ingram Zundel

More than thirty-two years have elapsed since the publication of the original text of this order in the present work. At the time of his death (13 August 1937), Dr. Clinton had accumulated many additions and corrections, and these have been utilized in the preparation of the following pages; but they were not in shape for publication, and this text has been prepared by the fellow-worker who was associated with him for many years in the study of this group of plants. Financial aid was given to this work by the Connecticut Agricultural Experiment Station.

Self-evident errors, and such as may readily be detected by reference to the bibliography or index, are not listed here.

The names of newly listed hosts are preceded by an asterisk ("*").

For convenience of reference the keys to the species of the larger genera have been corrected and revised, and are here reprinted in full.

USTILAGINACEAE

1. USTILAGO

A. Spores reddish-brown, olive-brown, or black-brown.

1. Spores perfectly smooth (see also nos. 3, 19, 25, 33).	
Spores small, 4–10 μ long.	
Sori around the internodes.	
Sori with false membrane of fungous threads.	1. *U. minima;* p. 5
Sori without evident false membrane.	2. *U. hypodytes;* p. 5
Sori often producing witches brooms.	2*a*. *U. Shiraiana;* p. 979
Sori in leaf-sheaths or blades; spores 8–11 μ long.	4. *U. calcara;* p. 6
Sori in individual spikelets.	
Spores lighter-colored on one side.	
Sori small, about 1 mm. long.	5. *U. mexicana;* p. 6
Sori 6–10 mm. long.	
Host: *Hordeum;* spore-mass purple-black.	6. *U. Hordei;* p. 6
Host: *Avena;* spore-mass brown-black.	7. *U. levis;* p. 7
Spores uniformly colored.	
Sori completely destroying spikelets.	
Host: *Cynodon.*	13*a*. *U. Cynodontis;* p. 981
Host: *Hilaria, Stenotaphrum.*	14. *U. affinis;* p. 9
Sori usually destroying inner and basal parts.	17. *U. Crameri;* p. 10
Sori involving entire inflorescence.	20. *U. Panici-proliferi;* p. 11
Sori composed of hypertrophied tissue.	37*a*. *U. esculenta;* p. 986
Spores medium, 10–14 μ long; sori in ovaries.	18. *U. lycuroides;* p. 10
Spores large, 13–22 μ long.	
Sori in the panicle.	50*a*. *U. Griffithsii;* p. 988
Sori in the leaves.	58. *U. Heufleri;* p. 20
2. Spores often apparently smooth but at least granular under an immersion lens.	
Sori in leaves.	
Spores 4–8 μ long.	3. *U. longissima;* p. 6
Spores 7–12 μ long.	3*a*. *U. Davisi;* p. 979
Sori in inflorescence, sometimes confined to spikelets.	13. *U. residua;* p. 9
Sori in spikelets.	
Sori rather completely destroying spikelets.	15. *U. Lorentziana;* p. 9
Sori destroying only basal and inner parts.	
Spores rather brittle.	15*a*. *U. bullata;* p. 983
Spores not so brittle.	16. *U. bromivora;* p. 10
Sori in ovaries; spores apparently smooth.	19. *U. Rickerii;* p. 11
Sori in flowers protected by perianth.	23. *U. Tillandsiae;* p. 11
3. Spores echinulate or verruculose (occasionally minutely or obscurely).	
Spores small, 4–9 μ long.	
Sori in leaves.	
Sori in striae or areas of considerable extent.	21. *U. Ulei;* p. 11
Sori pustular.	31. *U. minor;* p. 13

Sori in spikelets.
Sori destroying inner and basal parts of spikelets. 8. *U. perennans;* p. 7
Sori rather completely destroying spikelets.
Host: *Avena.* 9. *U. Avenae;* p. 7
Host: *Hordeum.* 10. *U. nuda;* p. 8
Host: *Triticum.* 11. *U. Tritici;* p. 8
Host: *Lolium.* 11*a*. *U. Lolii;* p. 981
Host: *Tripsacum.* 14*a*. *U. Petrakii;* p. 982
Sori involving or aborting inflorescence.
Sori ovoid to subspheric; spores 4–6 μ long. 12. *U. Muhlenbergiae;* p. 8
Sori linear; spores 6–11 μ long. 22. *U. chloridicola;* p. 11
Sori in ovaries.
Spores obscurely echinulate, often appearing smooth.
Spores uniformly colored, 4–6 μ long. 25. *U. Sieglingiae;* p. 12
Spores often lighter-colored on one side. 26. *U. Triplasidis;* p. 12
Spores evidently echinulate or verruculose. 27. *U. sparsa;* p. 12
Spores medium, 9–14 μ long (see also nos. 21, 47).
Sori on various parts of host.
Sori in upper part of culm. 13*b*. *U. Jacksonii;* p. 982
Sori in ovaries, nodes, etc., pustular, smooth.
Spores 9–7 μ long. 24*a*. *U. Coicis;* p. 984
Spores 9–12 μ long. 34. *U. togata;* p. 986
(*U. pustulata;* p. 14)
Sori at nodes and on leaves, nodular, hispid. 36. *U. Crus-galli;* p. 14
Sori usually at nodes, conspicuous, ovate to lanceolate. 37. *U. heterogena;* p. 15
Sori on any part of host, usually very conspicuous. 38. *U. Zeae;* p. 15
Sori forming elongate outbreaks, aborting inflorescence. 39. *U. Kellermanii;* p. 15
Sori in spikelets, infecting entire spike. 40. *U. neglecta;* p. 16
Sori in inflorescence (see also nos. 39, 48, 52).
Host: *Syntherisma* (*Panicum*). 46. *U. Rabenhorstiana;* p. 17
Host: *Chloris.* 51. *U. elegans;* p. 18
Sori in leaves.
Sori involving leaves at apex of culm and aborting inflorescence.
Sori elongate-ellipsoidal, 5–10 mm. long. 48. *U. Aegopogonis;* p. 17
Sori linear, very elongate, often 1 dm. long. 52. *U. Dieteliana;* p. 18
Sori in striae. 53. *U. striaeformis;* p. 18
Sori in ovaries (see also no. 34).
Sori conspicuous, chiefly 3–6 mm., hispid. 35. *U. sphaerogena;* p. 14
Sori rather inconspicuous, 1–4 mm. long.
Spores echinulate.
Host: *Eragrostis.* 28. *U. spermophora;* p. 12
Host: *Bouteloua.* 29. *U. Boutelouae;* p. 13
Host: *Tridens* (*Tricuspis*). 30. *U. Tricuspidis;* p. 13
Spores minutely and obscurely verruculose. 41. *U. Uniolae;* p. 16
Spores very conspicuously echinulate. 43. *U. ornata;* p. 16
Spores with coarse, often acute tubercles. 44. *U. Sporoboli;* p. 16
Sori very inconspicuous, 1 mm. in diameter or less. 42. *U. Eriocauli;* p. 16
Spores large, 14–18 μ, rarely 12 μ, long.
Sori in leaves.
Sori forming oblong pustules.
Spores echinulate. 32. *U. Hieronymi;* p. 13
Spores smooth or obscurely verruculose.
Sori 3–10 mm. long. 33. *U. Buchloes;* p. 14
Sori 1–5 mm. long. 33*a*. *U. pseudohieronymi;* p. 985
Sori forming linear striae; spores verrucose.
Spores granular-verruculose; 14–18 μ long. 33*b*. *U. Bethelii;* p. 985
Spores prominently verrucose; 13–20 μ long. 54. *U. Calamagrostidis;* p. 19
Sori in inflorescence.
Spores light-reddish-brown, minutely echinulate. 49. *U. Hilariae;* p. 18
Spores prominently echinulate; sorus with columella. 47. *U. Holwayana;* p. 17
Spores dark-reddish-brown, verruculose.
Host: *Sporobolus.* 45. *U. Vilfae;* p. 17
Host: *Paspalum.* 48*a*. *U. Schroeteriana;* p. 988
Host: *Festuca.* 50. *U. Mulfordiana;* p. 18
Sori in ovaries. 50*b*. *U. sphaerocarpa;* p. 988
4. Spores coarsely verruculose to occasionally semi-reticulate; sori on leaves.
Host: *Agropyron, Elymus.* 55. *U. macrospora;* p. 19
Host: *Phalaris.* 56. *U. echinata;* p. 20
Host: *Panicularia* (*Glyceria*), *Scolochloa.* 57. *U. Arthurii;* p. 20

B. Spores yellow or golden-brown.

Spores reticulate, 15–18 μ long. 57*a*. *U. Vuijckii;* p. 990
Spores smooth or obscurely echinulate, 7–12 μ long. 59. *U. Vaillantii;* p. 20
Spores coarsely verrucose, 13–20 μ long. 60. *U. Oxalidis;* p. 20

C. Spores violet or purple.

Spores very minutely and obliquely striate.
- Host: *Macounastrum* (*Koenigia*). — 69. *U. Koenigiae;* p. 23
- Host: *Polygonum*. — 70. *U. Piperii;* p. 23

Spores though appearing smooth very minutely pitted-reticulate. — 71. *U. punctata;* p. 23

Spores minutely verruculose. — 72. *U. Bistortarum;* p. 24

Spores with winged reticulations.
- Sori in stems, petioles and midribs. — 68. *U. Parlatorei;* p. 23
- Sori in inflorescence and floral axis. — 67. *U. Rumicis;* p. 23
- Sori in flowers or their organs.
  - Sori in ovaries and often stamens, inclosed by floral envelopes.
    - Spores small, 7–10 μ long, minutely reticulate (1 μ). — 61. *U. vinosa;* p. 21
    - Spores medium, 10–14 μ long.
      - Spores dark-purple; reticulations inconspicuous (1 μ), showing as papillae at margin. — 62*b*. *U. Alsineae;* p. 991
      - Spores purplish; reticulations small to medium. — 62*c*. *U. Duriaeana;* p. 991
      - Spores light-violet, rather finely reticulate (1–3 μ). — 65. *U. anomala;* p. 22
      - Spores purplish; reticulations coarser (2–4 μ). — 66. *U. utriculosa;* p. 22
    - Spores large, 14–17 μ long; reticulations 1.5–2 μ. — 64. *U. Calandriniae;* p. 22
  - Sori in anthers.
    - Spores 5–8 μ long. — 62. *U. violacea;* p. 21
    - Spores 7–12 μ long. — 62*a*. *U. Clintoniana;* p. 991
  - Sori in seeds, spores 12–18 μ long; reticulations about 1 μ.
    - Host: *Gayophytum*. — 63. *U. Gayophyti;* p. 21
    - Host: *Claytonia*. — 63*a*. *U. Claytoniae;* p. 991

1a. FARYSIA

One species. — 1. *F. olivacea;* p. 993

2. SPHACELOTHECA

Spores olive- or reddish-brown.
- Sori in ovaries.
  - Spores chiefly 5–8 μ long, smooth.
    - Sterile cells small. — 1. *S. Sorghi;* p. 25
    - Sterile cells large. — 1*a*. *S. cruenta;* p. 994
  - Spores chiefly 8–12 μ long.
    - Spores apparently smooth.
      - Sori linear.
        - Host: *Andropogon*.
          - Spores 7–12 μ long. — 2. *S. Seymouriana;* p. 25
          - Spores 14–18 μ long. — 8*a*. *S. panamensis;* p. 995
        - Host: *Sorghastrum* (*Chrysopogon*). — 3. *S. Chrysopogonis;* p. 26
      - Sori oblong to ovate. — 4. *S. Nealii;* p. 26
    - Spores verruculose.
      - Host: *Heteropogon* (*Andropogon*). — 5. *S. monilifera;* p. 26
      - Host: *Echinochloa, Syntherisma, Panicum*.
        - Spores minutely verruculose. — 6. *S. diplospora;* p. 26
        - Spores coarsely verruculose. — 6*a*. *S. veracruziana;* p. 994
      - Host: *Chaetochloa* (*Setaria*). — 7. *S. pamparum;* p. 27
      - Host: *Pennisetum*. — 7*a*. *S. Penniseti-japonici;* p. 995
  - Spores chiefly 12–17 μ long. — 8. *S. occidentalis;* p. 27
- Sori involving or aborting the entire inflorescence.
  - Sori linear to oblong.
    - Sori 10–40 mm. long.
      - Spores 7–10 μ long. — 9. *S. Ischaemi;* p. 27
      - Spores 12–15 μ long.
        - Host: *Hackelochloa* (*Manisuris*). — 9*a*. *S. erythraeensis;* p. 996
        - Host: *Andropogon*.
          - Spores 15–18 μ long. — 9*b*. *S. culmiperda;* p. 997
          - Spores 10–16 μ long. — 9*c*. *S. Kellermanii;* p. 997
        - Host: *Muhlenbergia*. — 13. *S. montaniensis;* p. 29
        - Host: *Eragrostis*. — 14. *S. strangulans;* p. 29
    - Sori 30–150 mm. long.
      - Spores 6–8 μ long.
        - Sterile cells not guttulate. — 10*b*. *S. Digitariae;* p. 998
        - Sterile cells, guttulate. — 11. *S. cordobensis;* p. 998 (*S. Panici-leucophaei;* p. 28)
      - Spores 7–10 μ long.
        - Spores verruculose. — 10. *S. Paspali-notati;* p. 28
        - Spores smooth. — 10*a*. *S. Panici-miliacei;* p. 997
      - Spores 9–13 μ long. — 12. *S. Andropogonis-hirtifolii;* p. 28

Spores lilac-tinted to purple, 8–17 μ long.
- Sori in inflorescence. — 16*a*. *S. inflorescentiae;* p. 999
- Sori in ovaries.
  - Spores verruculose, 10–17 μ long. — 16. *S. Hydropiperis;* p. 30
  - Spores apparently smooth, 9–11 μ long. — 16*b*. *S. borealis;* p. 999

3. MELANOPSICHIUM

One species. — 1. *M. austro-americanum;* p. 30

4. CINTRACTIA

Sori usually dusty at maturity (see also no. 11).
- Spores falsely two-celled. — 1*a*. *C. Farlowii;* p. 1000
- Spores apparently smooth (rarely pitted).
  - Spores chiefly 8–14 μ long.
    - Spores light reddish-brown. — 2. *C. Taubertiana;* p. 32
    - Spores dark reddish-brown. — 4. *C. limitata;* p. 32
  - Spores chiefly 12–19 μ long.
    - Spores often with lateral hyaline wings. — 1. *C. Montagnei;* p. 31
    - Spores under an immersion reticulately pitted. — 3. *C. Psilocaryae;* p. 32
    - Spores apparently quite smooth, irregular. — 5. *C. Cyperi;* p. 32
  - Spores with coarse scales. — 6. *C. subinclusa;* p. 32

Sori usually rather firmly agglutinated at maturity.
- Sori on leaves. — 3*a*. *C. arctica;* p. 1001
- Sori in ovaries.
  - Sori usually spheric or subspheric.
    - Spores with evident hyaline envelopes. — 8. *C. externa;* p. 34
    - Spores without evident hyaline envelopes.
      - Spores 16–20 μ long, rarely longer. — 7. *C. Caricis;* p. 33
      - Spores 20–30 μ long. — 9. *C. Luzulae;* p. 34
  - Sori chiefly ovoid, rarely subspheric. — 12. *C. utriculicola;* p. 35
  - Sori surrounding peduncles (rarely in inflorescence).
    - Sori without prominent false membrane, linear. — 10. *C. Junci;* p. 34
    - Sori with prominent white fungous membrane.
      - Sori subspheric.
        - Spores smooth.
          - Spores 12–18 μ long. — 11. *C. axicola;* p. 35
          - Spores 10–13 μ long. — 11*a*. *C. minor;* p. 1003
        - Spores verruculate, 11–15 μ long. — 11*b*. *C. Clintonii;* p. 1003
      - Sori oblong to linear.
        - Spores verruculate. — 13. *C. leucoderma;* p. 35
        - Spores with semi-spiral striae. — 13*a*. *C. striata;* p. 1004
        - Spores with reticulated striae. — 13*b*. *C. affinis;* p. 1004
        - Spores densely opaque. — 13*c*. *C. pachyderma;* p. 1004

5. SCHIZONELLA

One species. — 1. *S. melanogramma;* p. 36

6. MYCOSYRINX

One species. — 1. *M. Cissi;* p. 37

7. SOROSPORIUM

Sori large irregular masses, usually destroying the panicle. — 1*a*. *S. Reilianum;* p. 1005

Sori in the ovaries, usually small.
- Spore-balls quite temporary.
  - Spores 6–9 μ long. — 1. *S. consanguineum;* p. 37
  - Spores 8–12 μ long. — 2*a*. *S. ovarium;* p. 1005
  - Spores 11–16 μ long.
    - Spores chiefly smooth. — 2. *S. Eriochloae;* p. 38
    - Spores verruculose. — 2*b*. *S. confusum;* p. 1006
- Spore-balls rather permanent.
  - Spores 8–12 μ long, light-reddish-brown. — 3. *S. Everhartii;* p. 38
  - Spores 10–16 μ long, dark-reddish-brown. — 9. *S. Rhynchosporae;* p. 40

Sori aborting the inflorescence, very elongate.
- Spore-balls composed of many spores.
  - Spores rather thin-walled.
    - Spores 9–13 μ long.
      - Spores chiefly smooth. — 4. *S. contortum;* p. 38
      - Spores chiefly verruculose. — 5. *S. Syntherismae;* p. 38
    - Spores 12–19 μ long.
      - Host: *Andropogon, Aristida, Schizachyrium.* — 6. *S. Ellisii;* p. 39
      - Host: *Cerastium, Silene, Stellaria.* — 6*a*. *S. Saponariae;* p. 1007
  - Spores rather thick-walled (3 μ). — 7. *S. provinciale;* p. 39
- Spore-balls composed of few spores, usually 6–20. — 8. *S. granulosum;* p. 39

8. THECAPHORA

Sori pustular, 10–20 mm., on stems. — 1*a*. *T. pustulata;* p. 1007
Sori pustular, 1–5 mm., on various parts of hosts.
  Spore-balls of 2–6 spores. — 1. *T. pilulaeformis;* p. 40
  Spore-balls of 15–30 spores. — 6. *T. mexicana;* p. 42
  Spore-balls of 3–15 spores. — 7*a*. *T. Haumani;* p. 1008
  Spore-balls of 10 or more spores. — 7*b*. *T. Iresine;* p. 1008
  Spore-balls of 70 or more spores.
    Sori in flowers. — 7. *T. tunicata;* p. 42
    Sori in ovaries. — 8. *T. Thornberi;* p. 42
Sori indefinite, in the inflorescence.
  Sori in the flower heads.
    Spore-balls of 2–6 spores. — 2. *T. Trailii;* p. 41
    Spore-balls of 7–20 spores. — 3. *T. californica;* p. 41
    Spore-balls of 40–75 spores. — 4. *T. cuneata;* p. 41
  Sori inside bracts of staminate spikes. — 9. *T. aterrima;* p. 43
Sori in the seeds. — 5. *T. deformans;* p. 41

9. TOLYPOSPORELLA

Sori composed of definite spore-balls. — 1. *T. Chrysopogonis;* p. 43
Sori composed of spores rather indefinitely agglutinated.
  Sori hidden on inner surface of leaf-blades and leaf-sheaths.
    Spores without concentric layers. — 1*a*. *T. Sporoboli;* p. 1009
    Spores with faint concentric layers. — 2. *T. Brunkii;* p. 43
  Sori on exposed surface of leaves. — 3. *T. Nolinae;* p. 44

10. TOLYPOSPORIUM

Sori 2–5 mm. long; spores polygonal or irregularly subspheric.
  Sori destroying the inflorescence. — 1*a*. *T. Junci;* p. 1010
  Sori occupying only an occasional ovary. — 1. *T. bullatum;* p. 44
  Sori usually occupying all of the ovaries. — 2. *T. globuligerum;* p. 44
Sori 1–2 mm. long; spores uniformly subspheric. — 3. *T. Eriocauli;* p. 45

11. TESTICULARIA

One species. — 1. *T. Cyperi;* p. 45

TILLETIACEAE

1. TILLETIA

Spores smooth. — 1. *T. foetans;* p. 48
Spores reticulate.
  Sori 5–8 mm. long.
    Spores 16–22 μ long. — 2. *T. Tritici;* p. 48
    Spores 23–28 μ long. — 3. *T. Elymi;* p. 48
  Sori 3–5 mm. long.
    Sterile cells chiefly thin-walled; smaller than spores.
      Spores chiefly 25–30 μ long.
        Spores reddish-brown. — 4. *T. Anthoxanthi;* p. 48
        Spores light-reddish-brown. — 9*a*. *T. Holci;* p. 1011
        Spores golden-brown. — 11*a*. *T. decipiens;* p. 1012
      Spores 20–25 μ long.
        Spores golden-yellow. — 4*a*. *T. Guyotiana;* p. 1011
        Spores reddish-brown. — 8. *T. fusca;* p. 49
      Spores 28–34 μ long. — 5. *T. Muhlenbergiae;* p. 49
    Sterile cells with very thick walls (3–6 μ); larger than spores. — 10. *T. Redfieldiae;* p. 50
  Sori 1 or 2 mm. long.
    Sterile cells chiefly thin-walled; smaller than spores.
      Spores chiefly 25–30 μ long. — 6. *T. cerebrina;* p. 49
      Spores 17–25 μ long. — 9. *T. montana;* p. 49
    Sterile cells very thick-walled (3–8 μ); larger than spores. — 11. *T. asperifolia;* p. 50
Spores apparently verruculose. — 12. *T. Maclagani;* p. 50
Spores with prominent tubercles, spines or scales.
  Sori in the culms. — 13. *T. Earlei;* p. 50
  Sori in the ovaries.
    Spores chiefly 18–27 μ long.
      Spores without pedicle-like projection of hyaline envelope.
        Spores with prominent tubercles.
          Sori 3–5 mm. long. — 14. *T. texana;* p. 51
          Sori about 1 or 2 mm. long.

Mature spores ? but slightly tinted. 15. *T. Wilcoxiana;* p. 51
Mature spores golden-brown. 15*a*. *T. Youngii;* p. 1012
Mature spores chocolate-brown.
Host: *Bulbilis* (*Buchloe*). 16. *T. buchloeana;* p. 51
Host: *Cathestecum*. 17. *T. Cathesteci;* p. 51
Spores with coarse scale-like appendages. 19. *T. rugispora;* p. 52
Spores with pedicle-like projections of hyaline envelope. 18. *T. corona;* p. 52
Spores 25–35 μ long, occasionally smaller; with coarse scales.
Sori about 3–4 mm. long.
Completely destroying the seed. 20. *T. pulcherrima;* p. 52
Incompletely destroying the seed. 21. *T. horrida;* p. 52
Sori 1 mm. long or less. 22. *T. Eragrostidis;* p. 53

2. NEOVOSSIA

One species. 1. *N. iowensis;* p. 53

3. TUBURCINIA

Spore-balls, of 6 to many spores, 27–75 μ long. 1. *T. Clintoniae;* p. 54
Spore-balls, of 10 to many spores, 45–100 μ long. 2. *T. Trientalis;* p. 54

4. UROCYSTIS

Sori in leaves, pedicels, or stems.
Spore-balls without a true cortex. 1. *U. Waldsteiniae;* p. 55
Spore-balls with a true cortex.
Spores usually 1–5 in the balls.
Cortical cells incompletely covering spores. 2. *U. Anemones;* p. 55
Cortical cells rather completely covering spores. 3. *U. carcinodes;* p. 55
Spores usually 4–8 in the balls.
Cortical cells 8–15 μ; spore-balls 30–60 μ, rarely 90 μ.
Sori on stems. 4. *U. sorosporioides;* p. 56
Sori in ovaries. 5*a*. *U. Kmetiana;* p. 1014
Cortical cells 6–10 μ; spore-balls chiefly 28–55 μ. 5. *U. Violae;* p. 56
Spores usually 1, rarely 2–4, in the balls.
Cortical cells 6–10 μ, rarely 12 μ. 6. *U. Lithophragmae;* p. 56
Cortical cells usually 4–8 μ.
Cortical cells slightly tinted. 7. *U. Cepulae;* p. 57
Cortical cells light-brown. 7*a*. *U. magica;* p. 1015
Spores usually 1 or 2, rarely 3 or 4, in the balls.
Sori in areas or pustules. 8. *U. Colchici;* p. 57
Sori in striae.
Cortical cells incompletely covering spores. 9. *U. occulta;* p. 57
Cortical cells completely covering spores. 10. *U. Agropyri;* p. 58
Spores usually 1–3, rarely 4 or 5, in the ball.
Host: *Erythronium*. 7*b*. *U. Erythronii;* p. 1015
Host: *Triticum*. 9*a*. *U. Tritici;* p. 1017
Host: *Carex*. 10*a*. *U. Fischeri;* p. 1018
Spores usually 5–15 in the ball. 8*b*. *U. Flowersii;* p. 1016
Sori in the stems.
Spores usually 2–12 in the ball. 8*a*. *U. Trillii;* p. 1016
Spores usually 10–15, rarely 20, in a ball. 12*a*. *U. Fraserii;* p. 1018
Sori on corms and leaves. 8*c*. *U. Gladioli;* p. 1016
Sori in the culm filling the interior. 11. *U. Junci;* p. 58
Sori in the inflorescence.
Sori in the spikelets. 12. *U. granulosa;* p. 58
Sori in the flowers and pedicles. 13. *U. Hypoxyis;* p. 59
Sori on base of stem or roots.
Host: *Gilia*. 13*a*. *U. Giliae;* p. 1018
Host: *Sophia*. 13*b*. *U. coralloides;* p. 1019

5. ENTYLOMA

Sori black.
Spores tinted reddish-brown, agglutinated.
Spores chiefly 8–14 μ long.
Sori forming oblong to linear striae.
Spores 7–11 μ long. 1. *E. lineatum;* p. 60
Spores 8–14 μ long.
Spores chiefly regular. 2. *E. crastophilum;* p. 60
Spores often irregular and elongate. 3. *E. irregulare;* p. 60
Sori often fusing to form a continuous stratum. 4. *E. speciosum;* p. 60
Spores chiefly 15–22 μ long. 5. *E. caricinum;* p. 61
Spores tinted yellowish-brown, agglutinated.
Spores chiefly 7–10 μ long. 5*a*. *E. parvum;* p. 1020

Sori white to reddish-brown; spores hyaline, or yellowish-tinted.
Spores not apiculate, often agglutinated.
Sori thin—in the unthickened tissues.
Conidia or sporidia hypophyllous.
Spores chiefly 8–13 μ long, thin-walled (see also no. 16).
Sori angular.
Sori without evident hypophyllous growth. 6. *E. Thalictri;* p. 61
Sori with evident hypophyllous growth.
Host: Menispermaceae. 8. *E. Menispermi;* p. 61
Host: Ambrosiaceae, Carduaceae, Cichoriaceae. 9. *E. compositarum;* p. 62
Sori circular. 14. *E. Floerkeae;* p. 63
Spores chiefly 11–16 μ long, thick-walled.
Spore-walls evidently double.
Spore-walls not papillate.
Spores reddish-yellow. 7. *E. Ranunculi;* p. 61
Spores golden-yellow. 7*a*. *E. Meliloti;* p. 1020
Spores light-yellow. 9*a*. *E. Achilleae;* p. 1021
Spore-walls, occasionally, with evident papillae. 12. *E. arnicale;* p. 63
Double walls of spores not very evident.
Sori rather conspicuous, 2–5 mm. or even larger.
Sori yellowish above, white beneath; spores chiefly 9–12 μ. 16. *E. Lobeliae;* p. 64
Sori yellowish or reddish-brown, often bordered. 17. *E. australe;* p. 64
Sori small, usually less than 2 mm. in diameter.
Sori angular, usually with evident whitish growths. 19. *E. Saniculae;* p. 64
Sori chiefly subcircular.
Spores chiefly 9–12 μ in diameter. 21. *E. Linariae;* p. 65
Spores chiefly 13–14 μ in diameter. 21*a*. *E. Veronicae;* p. 1024
Spores chiefly 14–19 μ long.
Spores regular, subspheric. 22. *E. Ellisii;* p. 65
Spores ovoid to subspheric, often angular. 24. *E. fuscum;* p. 66
Conidia lacking or not observed.
Host: Ambrosiaceae, Carduaceae.
Sori often indefinite. 10. *E. polysporum;* p. 62
Sori conspicuous, reddish-brown. 11. *E. Holwayi;* p. 62
Sori irregular, 3–12 mm. 11*a*. *E. Dahliae;* p. 1022
Sori oval to subcircular.
Sori 5–6 mm. in diameter. 11*b*. *E. Calendulae;* p. 1022
Sori 3–5 mm. in diameter. 14*a*. *E. bavaricum;* p. 1023
Sori whitish, circular. 14*b*. *E. Agoseridis;* p. 1023
Sori often concavo-convex. 13. *E. guaraniticum;* p. 63
Host: not Ambrosiaceae, Carduaceae.
Spores often with hyphal pedicels.
Sori angular. 11*c*. *E. Circaeae;* p. 1022
Sori subcircular. 15. *E. Collinsiae;* p. 63
Spores without hyphal appendages.
Sori subcircular, conspicuous.
Spores smooth.
Sori 2–5 mm. diameter. 18. *E. serotinum;* p. 64
Sori 1–2 mm. diameter. 21*b*. *E. Clintonianum;* p. 1024
Spores verrucose. 21*c*. *E. Gratiolae;* p. 1025
Sori angular, often indefinite, less than 2 mm. 20. *E. Eryngii;* p. 65
Sori small, usually bordered. 23. *E. Eschscholtziae;* p. 65
Sori forming hard pustules, often concavo-convex. 25. *E. microsporum;* p. 66
Spores apiculate and pedicellate, never adhering. 26. *E. Nymphaeae;* p. 66

6. BURRILLIA

Sori forming scattered thickened spots in leaves.
Spore-balls small, 37–140 μ.
Spores 8–12 μ in diameter. 1. *B. decipiens;* p. 67
Spores 15–19 μ in diameter. 1*a*. *B. Limnanthemi;* p. 1026
Spore-balls large, 160–250 μ. 2. *B. Echinodori;* p. 67
Sori forming small hypophyllous blisters. 3. *B. pustulata;* p. 67
Sori embedded in lacunae within the leaf. 4. *B. Acori;* p. 1026

7. DOASSANSIA

EUDOASSANSIA. Spore-balls within the cortex consisting entirely of spores.
Sori forming scattered thickened spots in leaves.
Cortical cells inconspicuous, 3–10 μ long; spores smooth.

Host: Onagraceae.	1. *D. Epilobii;* p. 68
Host: Lobeliaceae.	1*a*. *D. Downingiae;* p. 1026
Cortical cells conspicuous, 10–20 μ long.	
Spores verrucose.	1*b*. *D. Callitriches;* p. 1027
Spores smooth.	
Cortical cells oblong to cubic; spore-balls 100–160 μ.	2. *D. ranunculina;* p. 68
Cortical cells ovate to subspheric; spore-balls 100–125 μ.	3. *D. Sagittariae;* p. 69
Cortical cells radially elongate, chiefly oblong; spore-balls 120–180 μ.	4. *D. Alismatis;* p. 69
Sori forming opaque pustules in leaves.	5. *D. opaca;* p. 69
DOASSANSIOPSIS. Spore-balls within the cortex consisting of one or more layers of spores and a central mass of parènchymatous cells.	
Sori in ovaries.	6. *D. occulta;* p. 70
Sori in leaves.	
Sori not causing distortion of tissues.	
Sori dark colored.	6*a*. *D. furva;* p. 1027
Sori yellowish.	
Spore-balls subspheric or spheric, 100–160 μ.	7. *D. Martianoffiana;* p. 70
Spore-balls ellipsoid or spheric, 200–300 μ.	8. *D. intermedia;* p. 70
Sori causing conspicuous distortion of tissues.	9. *D. deformans;* p. 71
PSEUDODOASSANSIA. Spore-balls within the cortex consisting of several layers of spores and a central mass of interwoven hyphae.	10. *D. obscura;* p. 71

8. TRACYA

One species.	1. *T. Lemnae;* p. 71

Family 1. USTILAGINACEAE

5. Ustilago minima.

Add, under POACEAE:

Eriocoma hymenoides (*Oryzopsis cuspidata*), Colorado.
**Sitanion Hystrix*, California.
**Stipa comata*, California.
**Stipa neomexicana*, Arizona.
**Stipa Scribneri*, Colorado.

5. Ustilago hypodytes.

Add the synonyms: *Cintractia distichlydis* McAlpine, Smuts Austr. 169. 1910. (Type from Australia, on *Distichlis maritima*.) ? *Ustilago agrestis* H. Sydow, Ann. Myc. **22**: 278. 1924. *Ustilago distichlydis* Ciferri, Ann. Myc. **26**: 32. 1928.

Add, under POACEAE:

**Agropyron repens*, New York.
Agropyron Smithii (*Agropyron occidentale*), Colorado.
Distichlis spicata (*D. maritima*), Utah.
Elymus condensatus, Utah.
**Elymus triticoides*, California, Nevada.
Eriocoma hymenoides (*Oryzopsis cuspidata*), California, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.
**Festuca Kingii*, Wyoming.
**Hilaria Jamesii*, Utah.
**Melica bulbosa* (*M. bella*), California.
**Panicum virgatum*, New York.
**Poa* sp., New York; Ontario.
Sitanion Hystrix (*S. californicum*, *S. longifolium*), New Mexico, Utah.
**Stipa clandestina*, Mexico.
**Stipa columbiana*, Colorado.
Stipa comata, California, South Dakota, Wyoming; Saskatchewan.
**Stipa Elmeri*, California.
**Stipa Lemmoni*, California.
**Stipa leucotricha*, Texas.
**Stipa neomexicana*, New Mexico.
Stipa occidentalis, California.
Stipa setigera, Mexico; Panama.
Stipa spartea, Iowa, Minnesota, North Dakota, Wisconsin.
**Stipa speciosa*, California, Nevada.
Stipa viridula, Colorado, North Dakota; Alberta, Manitoba.
Stipa sp., Puebla.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 13;* Phytop. Zeits. **9**: *f. 1–6.*

Add the exsiccati: Barth. Fungi Columb. *4794;* Brenckle, Fungi Dak. *542, 675;* Vesterg. Micr. Rar. Sel. *898, 899, 900.*

Add the note: In western specimens on certain hosts, as *Puccinellia* and *Sitanion*, the sori often occur in the inflorescence and leaves as linear striae, and on other hosts only in the leaves. In the east, on *Panicum virgatum*, from Staten Island, the striae also break out on the leaves. These unusual forms are difficult to distinguish by their spores alone from either *Ustilago hypodytes* or *U. longissima* (normally on the leaves), but are placed here under the former chiefly because of its great variety of hosts, in some of which the outbreaks occur on tissues other than the culms.

6. Insert:

2*a*. **Ustilago Shiraiana** P. Henn. Bot. Jahrb. **28**: 260. 1900.

Cintractia Bambusae Miyabe & Hori; Yoshino, Bot. Mag. Tokyo **19**: (199). 1905.

Sori surrounding the stems, especially on the young end-branches, rarely in closely placed striae or pustules on the older stems, at first covered by the epidermis but soon naked, forming oblong to linear-cylindric, agglutinated to semi-dusty, black-brown outbreaks, chiefly 5–10 mm. in length, more or less concealed by sheaths of the leaves, often producing witches-broom effect; spores light-brown, chiefly subspheric to spheric but occasionally more elongate, smooth, chiefly 5–9 μ but occasionally on some hosts more than 11 μ in length.

ON POACEAE:
Phyllostachys bambusoides, California, Florida, Louisiana.
Phyllostachys Henonis, California, Louisiana.
Phyllostachys Quilioi, Louisiana.
Phyllostachys sp., Florida, Mississippi.
TYPE LOCALITY: Nikko, Japan, on *Bambusa Veitchii*.
DISTRIBUTION: Japan, China and India; introduced in the United States occasionally on imported specimens but apparently not yet escaped.
EXSICCATI: Vesterg. Micr. Rar. Sel. *1597*.
NOTE: This smut on some specimens, and as originally described, has small spores very similar to those of *Ustilago hypodytes*, but on other specimens, especially those on *Phyllostachys*, the spores are more variable and attain a larger size. *Cintractia Bambusae* is said to occur in the leaves, but is given by Ideta as a synonym of this species, and a specimen we have labeled *Ustilago Bambusae* Miyabi on *Bambusa senamensis* from Japan is on the stems and belongs here.

6. **Ustilago longissima.**

Add, under POACEAE:

Glyceria grandis (*Panicularia americana*), Colorado, Nebraska, North Dakota, Oregon, Pennsylvania, Utah, Washington; Alberta, British Columbia, Manitoba, Saskatchewan.
**Glyceria obtusa* (*Panicularia obtusa*), Pennsylvania.
**Glyceria striata* (*G. nervata, Panicularia nervata*), Pennsylvania, Utah.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 12;* Arch. Nat. Land. Böhmen **15**[3]: *f. 5*.

Add the exsiccati: Sydow, Ust. *382;* Barth. Fungi Columb. *2399, 4098, 4199;* Brenckle, Fungi Dak. *135*.

6. Insert:

3*a*. **Ustilago Davisi** Liro, Ann. Acad. Sci. Fenn. A. **17**: 80. 1924.

Ustilago longissima var. *macrospora* Davis, Trans. Wis. Acad. **11**: 174. 1897. (Described under this name on page 6.)

ON POACEAE:
**Glyceria canadensis*, New Hampshire.
Glyceria fluitans, Michigan, Mississippi; Ontario.
TYPE LOCALITY: Wisconsin, on *Glyceria fluitans*.
EXSICCATI: Barth. Fungi Columb. *4598*.

6. **Ustilago Hordei.**

Add, under POACEAE:

**Hordeum distichon*, Colorado.
**Hordeum vulgare* (*H. sativum*), Alabama, Arizona, Arkansas, Delaware, Georgia, Idaho, Kentucky, Maryland, Minnesota, Montana, Nebraska, Nevada, New Jersey, New Mexico, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, Wyoming; Alberta, Manitoba, New Brunswick, Ontario, Prince Edward Island, Quebec, Saskatchewan; San Luis Potosí.
**Hordeum vulgare* var. *trifurcatum*, Colorado, New Mexico.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 5;* Arch. Nat. Land. Böhmen **15**[3]: *f. 3.*

Add the exsiccati: Barth. Fungi Columb. *3398*, *3794*, *4397*.

7. Ustilago levis.

Add, under POACEAE:

**Avena fatua*, Kansas; Saskatchewan.
**Avena fatua* var. *glabrata*, Washington.
**Avena nuda* var. *elegantissima*, Missouri.
**Avena orientalis*, Colorado.
Avena sativa, Alabama, Arkansas, California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia, Wyoming; Alberta, British Columbia, Manitoba, New Brunswick, Ontario, Prince Edward Island, Quebec, Saskatchewan; Bermuda.

Add the illustration: Arch. Nat. Land. Böhmen **15**[3]: *f. 2.*

Add the exsiccati: Barth. Fungi Columb. *3399* (mixed with *U. Avenae*), *3795*, *4398* (mixed); Brenckle, Fungi Dak. *90*.

Add the note: By artificial inoculation Fischer has infected the following grasses with this smut: *Agropyron pauciflorum*, *A. secundum*, and *Hordeum nodosum* (see Phytopathology **26**: 876–886. 1936).

7. Ustilago perennans.

Add the synonyms: *Uredo segetum* var. *decipiens* Wallr. Annus Bot. 139, in part. 1815. *Ustilago decipiens* Liro, Ann. Acad. Sci. Fenn. A. **17**: 95. 1924.

Add, under POACEAE:

Arrhenatherum elatius (*A. avenaceum*), Georgia, Idaho, Kentucky, Maryland, Michigan, Missouri, New Jersey, North Carolina, Oregon, Pennsylvania, Virginia, Washington, West Virginia; British Columbia, Ontario, Quebec.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 4.*

7. Ustilago Avenae.

Add, under POACEAE:

**Avena barbata*, California.
Avena fatua, Saskatchewan.
**Avena orientalis*, Colorado.
Avena sativa, Arizona, Arkansas, Colorado, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Nevada, Oregon, Pennsylvania, South Carolina, Utah, Virginia; Alaska; Alberta, British Columbia, Cape Breton Island, Manitoba, New Brunswick, Ontario, Prince Edward Island, Quebec, Saskatchewan; Bermuda.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 3.*

Add the exsiccati: Barth. Fungi Columb. *2998*.

Add the note: This smut has now been reported from every state in the United States and in each province of Canada on *Avena sativa*. Reed has also produced it artificially on the following species: *Avena barbata*, *A. fatua*, *A. ludoviciana*, *A. nuda*, *A. nuda* var. *inermis*, *A. orientalis*, *A. sterilis*, and *A. strigosa*.

8. Ustilago nuda.

Add the synonyms: *Ustilago medians* Biedenkopf, Zeits. Pflanzenkr. **4**: 321. 1894. *Ustilago nuda* var. *foliicola* Trott.; Sacc. & Trott. Ann. Myc. **11**: 415. 1913. *Ustilago nigra* Tapke, Phytopathology **22**: 869. 1932.

Add, under POACEAE:

**Hordeum vulgare* (*H. sativum*), Arkansas, California, Colorado, Delaware, Georgia, Idaho, Indiana, Kentucky, Louisiana, Maine, Minnesota, Montana, New Jersey, New Mexico, North Dakota, Oklahoma, Pennsylvania, South Carolina, Tennessee, Utah, Virginia, Washington, Wyoming; Alberta, Manitoba, New Brunswick, Ontario, Prince Edward Island, Quebec, Saskatchewan; Puebla, Queretaro. (This species in some cases may include *Hordeum distichon* and *H. hexastichon*.)

Add the illustration: Beitr. Krypt. Schweiz 3^2: *f. 2.*

Add the exsiccati: Brenckle, Fungi Dak. *25.*

Add the note: Several new forms, perhaps the result of natural hybridization, of *U. nuda* have been reported in recent years, of which *U. nigra* and *U. medians* are the best known. Taxonomically they must, for the present, be considered as synonyms of *U. nuda.* Economically *U. nuda* (*U. medians*) responds to different methods of control.

8. Ustilago Tritici.

Add the synonym: *Ustilago Vavilovi* * Jacz. Ann. State Inst. Exp. Agr. III. 2–4: 106–109. 1925.

Add, under POACEAE:

**Secale cereale*, Illinois, Indiana, Kentucky, Minnesota, Missouri, New York, North Dakota, Oklahoma, Tennessee, Virginia, West Virginia.
Triticum aestivum (*T. sativum*, *T. vulgare*), Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Maine, Maryland, Mississippi, Montana, Nevada, New Mexico, Oklahoma, Oregon, Pennsylvania, South Carolina, Utah, Virginia; Alberta, Manitoba, Nova Scotia, Ontario, Prince Edward Island, Quebec. (Perhaps this in some cases may include other cultivated species.)
**Triticum durum*, North Dakota; Manitoba, New Brunswick, Saskatchewan.
**Triticum Spelta*, Illinois.

Add the illustration: Beitr. Krypt. Schweiz 3^2: *f. 1.*

Add the exsiccati: Brenckle, Fungi Dak. *574.*

Add the note: Fischer reports finding this smut on *Agropyron cristatum* in central Washington as a natural infection. Later, artificially, the following grasses were infected: *Agropyron subsecundum*, *A. pauciflorum*, and *Hordeum nodosum* (see Phytopathology **26**: 876–886. 1936).

8. Insert:

11a. **Ustilago Lolii** Magnus, Hedwigia **49**: 93. 1909.

Ustilago segetum De-Toni, in Sacc. Syll. Fung. 7^2: 461. 1888.

Sori in the spikelets more or less destroying the glumes and sometimes running down on the rachis as short striae; spores reddish-brown, somewhat lighter-colored on one side, minutely echinulate, ovoid to subspheric or spheric or occasionally irregular, 5–8 μ in length.

ON POACEAE:
Lolium temulentum, Alabama.
TYPE LOCALITY: Egypt, on *Lolium temulentum*.
DISTRIBUTION: Egypt; introduced into Alabama at Demopolis.
NOTE: This smut is closely related to *Ustilago Tritici*, but in our specimen evidently is less destructive to the spikelets, the sori running down somewhat on the rachis as short striae.

9. Ustilago residua.

Add, under POACEAE:

**Danthonia americana*, Oregon.
Danthonia compressa, Pennsylvania.
Danthonia intermedia, Montana.
Danthonia spicata, Indiana, Ohio, Pennsylvania, Virginia, West Virginia.

9. Insert:

13a. **Ustilago Cynodontis** P. Henn. Bot. Jahrb. **14**: 369. 1891.

Sori in the inflorescence, changing its branches into linear dusty spore-masses with the floral parts all destroyed except the elongate crinkled rachis (or rarely with the destruction less complete and individual spikelets, chiefly the lower, infected, the upper being free but often abortive), 3–4 cm. in length, at first rather completely hidden by the enveloping leaf-sheaths; spores reddish-brown, subspheric or spheric, more or less cupped when dry, smooth, chiefly 6–8 μ in diameter.

* This smut was described as new on *Secale cereale* and the title of the publication in Russian is translated here. Recent experiments in the United States have shown that the smut occasionally found here on *Secale cereale* can be transferred to wheat and vice versa.

ON POACEAE:
Cynodon Dactylon, Arkansas, California, Texas; Cuba.
TYPE LOCALITY: Abyssinia, Africa, on *Cynodon Dactylon*.
DISTRIBUTION: Europe, Africa, Asia, southern United States.
ILLUSTRATION: Beitr. Krypt. Schweiz 3^2: *f. 6*.
EXSICCATI: Barth. Fungi Columb. *4998*.
NOTE: This species seems to be quite near *Ustilago affinis*. *U. Dregeana*, as originally described by Tulasne on an undetermined grass from Cape of Good Hope, has echinulate spores, but otherwise seems to agree; this species was later reported on *Cynodon Dactylon* from Africa, by Kalchbrenner, but with much larger spore-measurements, 12–15 μ. *Ustilago paraguariensis* Speg. also on this host, has larger spores as shown by the specimens from South Africa in Vesterg. Micr. Rar. Sel. *1322*. It is quite possible that the Kalchbrenner specimen is the same as this last, as the specimens are somewhat similar. The original specimens need to be examined to determine the questions involved.

13b. **Ustilago Jacksonii** Zundel & Dunlap, sp. nov.

Sori on upper parts of culms, running into and aborting the inflorescence by involving the pedicels, often containing empty spore-like cells the nature of which has not been determined; spores dark-reddish-brown, ovoid to subspheric, granular-verruculose, chiefly 9–12 μ in length. (See page 1029.)

ON POACEAE:
Stipa Lettermani, Colorado.
Type collected at Tolland, Colorado, on *Stipa Lettermani*, by Ellsworth Bethel, August 13, 1921; communicated by H. S. Jackson as *Ustilago hypodytes*.
DISTRIBUTION: Colorado.
NOTE: This was recognized by Dr. Clinton as a new species, but he did not write a description or select a name. In general appearance the sori look very much like *Sorosporium granulosum* but there is no indication of spore-balls.

9. **Ustilago affinis.**

Add, under POACEAE:

Stenotaphrum secundatum (*S. americanum*), Bermuda; Dominican Republic; Puerto Rico.

Add the exsiccati: Ciferri, Myc. Doming. Exs. *82*.

9. Insert:

14a. **Ustilago Petrakii** Ciferri, Ann. Myc. **29**: 293. 1931.

Sori in the individual spikelets usually destroying all in the spike, at first agglutinated and apparently hidden by the leaf-sheath, but finally exposed revealing the dusty mass of spores which become dissipated and leave only the hard basal tissues, rarely in the leaf-sheaths and then agglutinated and more permanent; spores light-reddish-brown, ovoid to subspheric or spheric, apparently smooth, but actually with the wall on one side thicker and darker and with indications of minute echinulations, chiefly 5–9 μ in length.

ON POACEAE:
Tripsacum dactyloides, Santo Domingo.
TYPE LOCALITY: Cordillera Septentrional, prov. Puerto Plata, road to Puerto Plata, Santo Domingo, on *Tripsacum dactyloides*.
DISTRIBUTION: Santo Domingo.
EXSICCATI: Ciferri, Myc. Doming. Exs. *83*.
NOTE: This species comes very close to *Ustilago affinis*, and shows its relationship with other species such as *U. Tritici*, under the immersion lens, by the thinner and darker sides of the spore-wall with indications of minute echinulations. Ciferri's specimen in his exsiccati shows most of the spores dissipated.

9. **Ustilago Lorentziana.**

Add, under POACEAE:

Elymus Macounii, Manitoba.
Hordeum caespitosum, Nevada, Wyoming.
Hordeum jubatum, Colorado, Idaho, Iowa, Minnesota, Washington, Wisconsin, Wyoming; Alaska; Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan.
Hordeum murinum, Oregon.
Hordeum nodosum (*H. pratense*), Idaho, Washington.
Hordeum pusillum, Utah.
Hordeum sp., Utah. (Utah specimen labeled ? *Elymus triticoides*.)
**Sitanion Hystrix* (*S. californicum*), Utah.

Insert: ILLUSTRATIONS: Mycologia **29**: 410. *f. 3, 18.*

Add the exsiccati: Barth. Fungi Columb. *3797.*

10. Insert:

15a. **Ustilago bullata** Berk. in Hook. f. Fl. Nov. Zeland. **2**: 196. 1855.

Ustilago Agropyri Bisby & Buller, Trans. Brit. Myc. Soc. **8**: 98; hyponym. 1922.

Sori in the spikelets, usually infecting all but destroying only the slightly swollen basal parts, covered at first by a semi-transparent membrane of plant tissues which eventually ruptures and liberates the purple-black, dusty spore-mass; spores reddish-brown, broadly ovoid to spheric, chiefly subspheric, with the brittle epispore usually breaking up so as to form lighter granular-verruculate poles and a dark continuous or less broken equatorial band, chiefly 6–10 μ in length.

ON POACEAE:
Agropyron caninum, Wyoming.
Agropyron dasystachyum, Saskatchewan.
Agropyron pauciflorum (*A. tenerum*), Idaho, Minnesota, Washington; Alberta, Manitoba, Nova Scotia, Quebec, Saskatchewan.
Agropyron subsecundum (*A. Richardsoni*), Saskatchewan.
TYPE LOCALITY: Antarctic Regions, on *Triticum* (*Agropyron*) *scabrum*.
DISTRIBUTION: United States and Canada; also in the Antarctic Regions, Australia, New Zealand, and Asia Minor.
ILLUSTRATIONS: Hook. f. Fl. Nov. Zeland. **2**: *pl. 106, f. 12;* Mycologia **29**: 410. *f. 1, 17.*
EXSICCATI: Barth. Fungi Columb. *3796, 4530.*
NOTE 1: This smut is near *Ustilago bromivora*, from which it differs in the hosts it attacks, its more evident appearance in the spikelets and the manner in which the epispore breaks up into the polar granular-verruculations (although *U. bromivora* has a very brittle epispore that breaks up into more uniformly scattered granular-verruculations). Quite distinct from *U. macrospora*, found on leaves of *Agropyron*.
NOTE 2: Recent cross-inoculation work by Fischer strongly indicates that *Ustilago bullata, U. bromivora*, and *U. Lorentziana* should be considered as one species (see Mycologia **29**: 408–425. 1937).

10. **Ustilago bromivora.**

Add the synonym: *Ustilago patagonica* Ciferri, Ann. Myc. **26**: 32. 1928. (Type on *Bromus unioloides.*)

Add, under POACEAE:

Bromus arvensis, New York.
Bromus breviaristatus, Michigan.
**Bromus carinatus*, California, Idaho, Oregon, Utah, Washington.
**Bromus catharticus* (*B. unioloides*), Colorado, North Dakota, Oregon, Texas.
Bromus ciliatus (*B. Richardsoni*), New Mexico; Saskatchewan.
**Bromus commutatus*, Oregon.
**Bromus commutatus* var. *apricorum*, Washington.
**Bromus japonicus*, Kansas.
Bromus Kalmii, Montana.
Bromus marginatus, Idaho, Montana, Nevada, Utah, Washington.
**Bromus marginatus* var. *latior*, Washington.
Bromus mollis (*B. hordeaceus*), Colorado, Montana, Oregon, Utah.
Bromus polyanthus, Colorado, New Mexico, Wyoming.
Bromus Pumpellianus, Michigan, Montana.
**Bromus rigidus* (*B. villosus*), Oregon.
Bromus secalinus, Montana, Washington.
**Bromus secalinus* var. *velutinus*, Oregon.
**Bromus sterilis*, Washington.
**Bromus tectorum*, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming.
**Bromus Trinii*, California.
Bromus vulgaris, California.

Add the illustration: Mycologia **29**: 417. *f. 4–16.*

Add the exsiccati: Barth. Fungi Columb. *4897;* Brenckle, Fungi Dak. *475;* Vesterg. Micr. Rar. Sel. *891;* Sydow, Ust. *379, 380.*

10. **Ustilago Crameri.**

Add, under POACEAE:

Chaetochloa italica (*Setaria italica*), Colorado, Minnesota, Missouri, Montana, Pennsylvania; Ontario, Saskatchewan.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 9;* Arch. Nat. Land. Böhmen **15**[3]: *f. 1.*

11. **Ustilago Panici-proliferi.**

Add, under POACEAE:

**Panicum* sp., Jalisco.

11. **Ustilago chloridicola.**

Add, under POACEAE:

*?*Chloris radiata*, Jamaica.
**Chloris verticillata*, California.

12. **Ustilago olivacea.**

Becomes a synonym of **Farysia olivacea** (page 993).

12. Insert:

24a. **Ustilago Coicis** Bref. Unters. Gesammt. Myk. **12**: 110. 1895.

Sori in the ovaries, destroying and deforming them and causing varying degrees of enlargement, sometimes attacking the culms, more or less hidden by the glumes and surrounded by a membrane, the mature spores forming a brown dusty mass; spores olivaceous-brown, ovoid to subspheric or spheric, regular, echinulate, 9–7 μ in length.

ON POACEAE:
Coix Lacryma-Jobi, District of Columbia (in greenhouse, from Philippine Islands seeds).
TYPE LOCALITY: Simla, India, on *Coix Lacryma-Jobi*.
DISTRIBUTION: Washington, District of Columbia (in greenhouses); India, Japan, Java, and the Philippines.
ILLUSTRATION: Phytopathology **10**: 332.

12. **Ustilago Sieglingiae.**

Add, under POACEAE:

Triplasis purpurea (*Sieglingia purpurea*), Illinois, Iowa, North Carolina.

12. **Ustilago spermophora.**

Add the synonym: *Sphacelotheca spermophora* Moesz, Bot. Közlem. **19**: 63. 1920.

Add, under POACEAE:

Eragrostis cilianensis (*E. major*), Maryland, North Dakota.
**Eragrostis minor*, Illinois.

Add the exsiccati: Barth. Fungi Columb. *4300*.

13. **Ustilago Boutelouae.**

Add, under POACEAE:

Bouteloua gracilis (*B. oligostachya*), Texas.
**Bouteloua hirsuta*, Texas.
**Bouteloua simplex* (*B. procumbens*, *B. prostrata*), Arizona; Zacatecas.

Add the exsiccati: Barth. Fungi Columb. *2498*.

13. **Ustilago Tricuspidis.**

Add, under POACEAE:

**Triodia flava* (*Tridens flavus*), Tennessee.

13. **Ustilago minor.**

Add the synonym: *Ustilago Hieronymi* var. *minor* Ciferri, Trans. Brit. Myc. Soc. **18**: 262. 1934.

Add the note: D. Griff. W. Am. Fungi *218*, *219*, *220*, *224*, *227*, were erroneously issued as *Ustilago minor*. These numbers are *U. Hieronymi*, as previously pointed out under

exsiccati in N. Am. Flora **7**: 14. 1906. The only available specimen of *U. minor* is in the herbarium of the Botany Department, Kansas Agricultural Experiment Station, Manhattan, Kansas.

13. **Ustilago Hieronymi.**

Add the synonym: *Ustilago Hieronymi* var. *insularis* Ciferri, Myc. Doming. Exs. *134*. 1931; Ann. Myc. **31**: 157. 1933. (Type from Santo Domingo, on *Bouteloua heterostega*.)

Add, under POACEAE:

Atheropogon curtipendulus (*Bouteloua curtipendula*, *B. racemosa*), Colorado, Indiana, North Dakota.
Bouteloua eriopoda, New Mexico.
Bouteloua gracilis (*B. oligostachya*), Texas, Utah.
**Bouteloua heterostega*, Santo Domingo; Puerto Rico.
**Bouteloua* sp., Colorado.
Triathera aristidoides (*Bouteloua aristidoides*), Arizona; Sonora.

Add the exsiccati: Barth. Fungi Columb. *3397;* Brenckle, Fungi Dak. *75;* Sydow, Ust. *402*, *429;* Ciferri, Myc. Dom. Exs. *134*.

Add the note: This species varies greatly on its different hosts, but the forms merge into one another; until one has them on all hosts from all known localities he can not safely separate them into species and varieties, and even then it is doubtful whether he can do better than to combine them, as here, in one species. The spores are smaller (11–15 μ long) on *Bouteloua eriopoda*, while on *B. gracilis*, *B. heterostega*, *Atheropogon curtipendulus*, *Triathera aristidoides*, and *Dasyochloa pulchella* (*Triodia pulchella*) they vary from 12 to 21 μ. The type of the species, on *B. ciliata* from Argentina, is intermediate, 12–17 μ. In some specimens the smut is confined chiefly or entirely to the inflorescence, as shown by Griffiths' specimens (W. Am. Fungi *220* and *224*) and the Kern specimen from Puerto Rico.

14. **Ustilago Buchloes.**

Add, under POACEAE:

Buchloe dactyloides (*Bulbilis dactyloides*), Colorado.

14. Insert:

33a. **Ustilago pseudohieronymi** Zundel, Mycologia **25**: 351. 1933.

Ustilago coloradensis Zundel, Mycologia **25**: 351. 1933. (Type from Colorado, on *Muhlenbergia gracillima*.)

Sori on the leaves and leaf-sheaths as oblong-cylindric pustules rounded at the ends, 1–5 mm. in length or by fusion longer, at first covered by the epidermis which when ruptured discloses the dark spore-mass; spores chiefly spheric to ovoid but often irregular or angular, blackish-brown, rather opaque, apparently smooth but under an immersion lens sometimes showing obscure verruculations, 14–20 μ in length.

ON POACEAE:
Bouteloua gracilis (*B. oligostachya*), Colorado.
Muhlenbergia gracillima, Colorado.
Muhlenbergia squarrosa, Colorado.
TYPE LOCALITY: San Luis Valley, Colorado, on *Muhlenbergia squarrosa*.
DISTRIBUTION: Colorado.
NOTE: This species is very similar to *Ustilago Hieronymi* and *U. Buchloes*. Zundel's *U. coloradensis* on the whole has less evident verruculations or nearly smooth and approaches nearer to those species.

33b. **Ustilago Bethelii** Zundel, Mycologia **25**: 350. 1933.

Sori in the leaves as striae ranging from a few cm. long to nearly the entire length of the leaf, finally causing the leaves to become shredded, at first covered by the epidermis but when ruptured disclosing a black spore-mass; spores spheric to ovoid, regular, dark-

reddish-brown, apparently smooth but under an immersion lens granular-verruculose, chiefly 14–18 μ but sometimes 21 μ in length. (See page 1029.)

ON POACEAE:
Muhlenbergia montana, Colorado.
TYPE LOCALITY: Idaho Springs, Colorado, on *Muhlenbergia montana*.
DISTRIBUTION: Colorado.
NOTE: The spores differ from those of *Sphacelotheca montaniensis* in being larger, darker, with less evident markings and in the sori being confined to the leaves and not to the inflorescence. It differs from *Ustilago pseudohieronymi* in the sori appearing on the leaves as striae rather than as cylindric swellings and in the more regular spores.

14. **Ustilago pustulata.**

Reduce this name to synonymy and substitute: **Ustilago togata** Liro, Ann. Acad. Sci. Fenn. A. **17**: 183. 1924.

Add, under POACEAE:

Panicum dichotomiflorum (*P. proliferum*), District of Columbia, Indiana, New Jersey.

Add the exsiccati: Barth. Fungi Columb. *3299*.

Add the note: Winter apparently first used the specific name *Ustilago pustulata* (DC.) in 1880 (Hedwigia **19**: 109) to distinguish one of the two forms of *Ustilago Bistortarum* called f. *pustulata* and f. *marginalis*, before Tracy & Earle in 1895 used this name for the smut mentioned here. The name is now used by some in Europe for the *Polygonum* smut as a distinct species called *Ustilago pustulata* (DC.) Winter; hence the name given here.

14. **Ustilago sphaerogena.**

Add, under POACEAE:

Echinochloa Crus-galli (*Panicum Crus-galli*), Colorado, Indiana, Massachusetts, Pennsylvania, Wisconsin.
Echinochloa Walteri (*Panicum Walteri*), Connecticut, Indiana.

Add the exsiccati: Barth. Fungi Columb. *4599*.

14. **Ustilago Crus-galli.**

Add, under POACEAE:

Echinochloa Crus-galli (*Panicum Crus-galli*), Nevada, New York, Oklahoma, Wyoming; Quebec.
**Echinochloa frumentacea*, Connecticut.
**Echinochloa zelayensis*, New Mexico.

Add the exsiccati: Vesterg. Micr. Rar. Sel. *892*.

15. **Ustilago heterogena.**

Add, under POACEAE:

**Leptochloa filiformis* (*L. mucronata*), Arizona; Sonora.
**Leptochloa viscida*, Arizona; Sonora.

15. Insert:

37a. **Ustilago esculenta** P. Henn. Hedwigia **34**: 10. 1895.

Sori embedded in the hypertrophied tissues of the culms, occurring as small somewhat round or elongate sac-like cavities surrounded by a thin hyaline layer, olive-brown; spores reddish-brown, spheric to subspheric, thick-walled, smooth, chiefly 6–8 μ in diameter.

ON POACEAE:
Zizania latifolia, District of Columbia (in greenhouse).
TYPE LOCALITY: French Indo-China, on *Zizania latifolia*.
DISTRIBUTION: District of Columbia (greenhouse); French Indo-China, Formosa, and Japan.

15. **Ustilago Zeae.**

Add, under POACEAE:

Euchlaena mexicana (*E. luxurians*), District of Columbia, Indiana, New York; Dominican Republic; Durango.
Zea Mays, Arizona, Arkansas, Colorado, Delaware, Florida, Idaho, Kentucky, Louisiana, Montana, Nevada, New Hampshire, New Mexico, North Dakota, Oregon, Tennessee, Virginia, Washington, Wyoming; Alberta, Manitoba, New Brunswick, Quebec, Saskatchewan; Bermuda, Guadeloupe, St. Croix.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 15.*

Add the exsiccati: Barth. Fungi Columb. *2700;* Brenckle, Fungi Dak. *156.*

Add the note: This smut has now been reported from all of the states, as well as from Canada, the West Indies, and Mexico.

15. **Ustilago Kellermanii.**

Add, under POACEAE:

Euchlaena mexicana (*E. luxurians*), Guatemala.

Add the note: This is the second time, 1923, that this unusual smut has been reported from Guatemala on this same host; there was a question about the identity of Kellerman's collection in 1906, but this later collection removes that doubt. The collection of Ciferri from Santo Domingo, named as this species, we refer to *Ustilago Zeae.*

16. **Ustilago neglecta.**

Add, under POACEAE:

Chaetochloa lutescens (*C. glauca, Setaria glauca, S. lutescens*), Colorado, Michigan, Mississippi, Missouri, North Dakota, Pennsylvania; Alberta, Manitoba, Ontario, Quebec.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 14.*

Add the exsiccati: Barth. Fungi Columb. *3100, 3599, 3999, 4200;* Brenckle, Fungi Dak. *275.*

16. **Ustilago Uniolae.**

Add, under POACEAE:

Uniola laxa (*U. gracilis*), Alabama, North Carolina.

Add the exsiccati: Barth. Fungi Columb. *2699.*

16. **Ustilago ornata.**

Add, under POACEAE:

**?Leptochloa uninervia* (*?L. imbricata*), Mississippi.

17. **Ustilago Vilfae.**

Add, under POACEAE:

Sporobolus neglectus, Indiana, South Dakota.
Sporobolus vaginiflorus, Indiana.

17. **Ustilago Rabenhorstiana.**

Add, under POACEAE:

Syntherisma filiforme (*Panicum filiforme*), Missouri.
Syntherisma sanguinale (*Panicum sanguinale*), Arkansas, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia; Ontario.
Syntherisma sp. (*Panicum* sp.), Oklahoma.

Add the exsiccati: Barth. Fungi Columb. *2297, 4099;* Sydow, Ust. *455.*

18. Insert:

48a. **Ustilago Schroeteriana** P. Henn. Hedwigia **35**: 215. 1896.

Sori in individual spikelets usually changing into dusty dark-brown spore-masses about 1 mm. long but not completely destroying all of the floral parts; spores reddish-brown, chiefly subspheric to spheric, apparently smooth but under an oil-immersion lens minutely verruculose, chiefly 12.5–16.5 μ in length; some suggestions of hyaline, fungous cells.

ON POACEAE:
Paspalum conjugatum, Grenada.
Paspalum repens (*P. paniculatum*), Panama.
Paspalum sp., Puerto Rico.
TYPE LOCALITY: Santa Catharina, Brazil, on *Paspalum* sp.
DISTRIBUTION: Panama; Puerto Rico; Grenada; also in Brazil.
NOTE: We have compared the Panama specimen with the type material from Brazil and find them identical, with hosts probably the same. It differs from *Ustilago Holwayana* in that the sori are confined to the spikelets and have less evident markings on the spores.

18. **Ustilago Hilariae.**

Add, under POACEAE:

Hilaria mutica, New Mexico.

Add: EXSICCATI: Vesterg. Micr. Rar. Sel. *897*.

18. **Ustilago Mulfordiana.**

Add, under POACEAE:

Festuca octoflora (*F. tenella*), Colorado.
Festuca sp., Quebec.

Add the exsiccati: Barth. Fungi Columb. *3298;* Vesterg. Micr. Rar. Sel. *903*.

18. Insert:

50a. **Ustilago Griffithsii** H. Sydow, Ann. Myc. **5**: 290. Jl 1907.

Ustilago Microchloae D. Griff. Bull. Torrey Club **34**: 207. Ap 1907. Not *U. Microchloae* Sydow & Butler, 1906.

Sori in the inflorescence, destroying all or most of the spikelets, linear, 1.5–3 cm. long, at first hidden by enveloping leaves but eventually more exposed and showing a black dusty spore-mass, soon dissipating and leaving behind a prominent toothed columella of plant-tissues; spores reddish-black, subopaque to opaque, chiefly subspheric to spheric or somewhat compressed and so oval in side view, thick-walled, with a thin or ruptured spot in center, apparently smooth, 14–18 μ in diameter.

ON POACEAE:
Microchloa indica (*M. setacea*), Aguas Calientes, Distrito Federal, San Luis Potosí.
TYPE LOCALITY: San Luis Potosí, on *Microchloa indica*.
DISTRIBUTION: Central Mexico.
NOTE: This comes nearest, perhaps, to *Ustilago Mulfordiana*, but differs distinctly from that species in the somewhat larger smooth spores. In color and brittleness of cell-wall the spores resemble certain species of *Cintractia* on the sedges. Looking at the spores as ordinarily seen in the circular outline, the wall over the center appears much thinner and so less opaque than the thick equatorial wall and often has a small ruptured area in the center. Whether this rupture is due to the fragile nature of the wall, or has to do with germination, we do not know; it suggests *Cladochytrium* or similar genera. The toothed character of the columella or rachis is due to the remains of the spikelets, which are borne in a one-sided simple spike.

50b. **Ustilago sphaerocarpa** Sydow, Ann. Myc. **15**: 145. 1917.

Sori in the ovaries, evident as oblong bodies between the glumes of one or more spikelets, 3–5 mm. in length; spores rather regularly subspheric or spheric, dark-reddish-brown, opaque, apparently smooth but obscurely verruculate under an oil-immersion lens, 15–18 μ, rarely 20 μ, in diameter.

ON POACEAE:
Festuca amplissima, Distrito Federal.
TYPE LOCALITY: Popocatepetl, on *Festuca amplissima*.
DISTRIBUTION: Mexico.
NOTE: This species comes very close to *U. Mulfordiana*, but differs in somewhat larger, more irregular spores limited to the ovaries. It has more or less resemblance to a *Tilletia* type with sterile cells or immature spores.

18. Ustilago elegans.

Add the exsiccati: Vesterg. Micr. Rar. Sel. *893.*

18. Ustilago striaeformis.

Add the synonyms: *Ustilago Salveii* Berk. & Br. Ann. Mag. Nat. Hist. II. **5**: 463. 1850. *Ustilago Agrostis-palustris* W. H. Davis; Ciferri, Ann. Myc. **29**: 54. 1931. *Ustilago Phleipratensis* W. H. Davis; Ciferri, Ann. Myc. **29**: 55. 1931. *Ustilago Johnstonii* Ciferri, Nuovo Giorn. Bot. Ital. II. **40**: 261. 1933.

Add, under POACEAE:

**Agropyron pauciflorum* (*A. tenerum*), Colorado, South Dakota.
**Agrostis exarata* (*A. microphylla*), Oregon.
**Agrostis perennans*, Pennsylvania.
Agrostis tenuis (*A. alba* var. *vulgaris*), Indiana, Maryland, Massachusetts, New York, Oregon, Pennsylvania, Washington, West Virginia, Wisconsin; British Columbia.
**Beckmannia Syzigachne* (*B. erucaeformis*), Alberta, Manitoba.
**Bromus secalinus*, Illinois.
**Dactylis glomerata*, Massachusetts, Pennsylvania, Tennessee, West Virginia.
**Elymus canadensis*, Missouri.
Elymus canadensis var. *glaucifolius*, Minnesota.
**Elymus glaucus*, Utah.
**Elymus Macounii*, South Dakota.
**Elymus striatus*, Illinois.
**Elymus triticoides*, Nevada.
Elymus virginicus, Indiana, Iowa.
**Elymus* sp., Idaho.
**Festuca elatior*, Illinois.
Festuca obtusa (*F. nutans*), Iowa, Maryland.
**Festuca ovina*, North Dakota.
**Festuca saximontana*, Colorado.
**Holcus lanatus*, California, Oregon.
**Hordeum jubatum*, South Dakota.
**Hystrix patula* (*H. Hystrix*), Kansas (type of *U. Johnstonii*).
**Lolium perenne*, Oregon.
**Phalaris arundinacea*, Maine.
Phleum pratense, Connecticut, Idaho, Kentucky, Maryland, Michigan, Montana, North Dakota, Oregon, Pennsylvania, Washington, West Virginia; Ontario.
**Poa compressa*, California, Indiana, West Virginia.
**Poa palustris* (*P. triflora*), South Dakota.
Poa pratensis, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, New York, Pennsylvania, Virginia, West Virginia, Wisconsin.
**Poa trivialis*, Connecticut.

Add the illustration: Beitr. Krypt. Schweiz **3**^{2}: *f. 19.*

Add the exsiccati: Barth. Fungi Columb. *3300;* Brenckle, Fungi Dak. *499*, *499a*, *597*, *598*, *599*, *600;* Vesterg. Micr. Rar. Sel. *904.*

Add the note: Species-makers have begun to split this species into species and forms based on the host-genus or host-species, and in some cases even splitting these further. This complicated treatment of species, which can only be determined if one knows the host or the locality from which it came, greatly and unnecessarily adds to the synonymy.

19. Ustilago Calamagrostidis.

Add, under POACEAE:

Calamagrostis canadensis, Indiana, Wisconsin; Alberta.

19. Ustilago macrospora.

Add, under POACEAE:

**Agropyron pauciflorum* (*A. tenerum*), Utah.
Agropyron repens, Minnesota.
**Bromus inermis*, Iowa.
**Elymus canadensis*, Colorado, Nebraska, South Dakota.
**Elymus glaucus*, Utah.
**Elymus robustus*, Utah.
**Elymus virginicus* var. *intermedius* (*E. virginicus* var. *hirsutiglumis*), Missouri.

Add the exsiccati: Brenckle, Fungi Dak. *624.*

20. **Ustilago echinata.**

Add, under POACEAE:

Phalaris arundinacea, Michigan, South Dakota.

Add: EXSICCATI: Brenckle, Fungi Dak. *595*.

20. **Ustilago Arthurii.**

Add, under POACEAE:

Fluminea festucacea (*Scolochloa festucacea*), South Dakota.

Add the exsiccati: Brenckle, Fungi Dak. *594*.

20. Insert:

57a. **Ustilago Vuijckii** Oud. & Beijer.; Oud. Versl. Akad. Amst. IV. **3**: 55. 1895.

Cintractia Vuijckii Ciferri, Ann. Myc. **29**: 72. 1931.

Sori completely hidden in ovaries, the spore-mass, on dehiscence of the capsule, escaping between the valves and showing as a dusty yellowish powder, apparently incompletely filling it; spores spheric, hyaline, yellowish or eventually light-yellowish-brown, reticulate (the polygonal meshes 2–3 μ), but on margin and young spores appearing as coarse tubercles projecting 1.5–2 μ beyond the cell-wall, chiefly 15–18 μ in diameter.

ON JUNCACEAE:
Luzula glabrata (*Juncoides glabratum*), Washington (Mt. Rainier Meadows).
TYPE LOCALITY: Voorschoten, Holland, on *Luzula campestris*.
DISTRIBUTION: Washington; also in Europe.
ILLUSTRATION: Ann. Acad. Sci. Fenn. A. **17**: 519, *f. 9*.

NOTE: This smut agrees with the specimen originally described from Holland on *Luzula campestris* and since reported from several European countries on this host and other species of *Luzula*. Usually mixed with and adhering to the spores or in masses, one finds numerous minute sporidium-like hyaline bodies probably budding yeast-fashion; whether these are connected with the spores in any way I do not know. They sometimes appear to be broken off tubercle-like projections, but are not.

Not reported before from America. If the germination had not been given in the original description as producing lateral as well as terminal sporidia, I should say from appearances that this was a *Tilletia* instead of a *Ustilago*. The specific name is variously spelled by different authors. Sydow (Bot. Jahresb. **22**: 84. 1894) says it was described as occurring in anthers and ovaries; he also says it is distinct from *Ustilago capensis* Reess, which seems to be the only species with which it might be confused.

20. **Ustilago Heufleri.**

Add, under LILIACEAE:

**Erythronium albidum*, Missouri.
Erythronium americanum, Connecticut, Delaware, District of Columbia, Maryland, Massachusetts; Quebec.
**Erythronium* sp., Ohio.

20. **Ustilago Vaillantii.**

Add, under LILIACEAE:

**Muscari comosa*, Massachusetts.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 10*.

20. **Ustilago Oxalidis.**

Add, under OXALIDACEAE:

**Oxalis corniculata*, New York, Pennsylvania, West Virginia.
Oxalis stricta (may include other species), Indiana, Nebraska, New Jersey, North Carolina, Pennsylvania, South Carolina, South Dakota, Texas.

Add the exsiccati: Barth. Fungi Columb. *2499;* Brenckle, Fungi Dak. *596*.

21. **Ustilago vinosa.**

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 20*.

21. **Ustilago violacea.**

Add, under CARYOPHYLLACEAE:

**Dianthus Caryophyllus*, Ontario.
Moehringia lateriflora (*Arenaria lateriflora*), Utah.
**Silene caroliniana* (*S. pennsylvanica*), New York, Virginia.
Silene Lyallii, Wyoming.
**Silene oregana*, Washington.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 26.*

21. Insert:

62a. **Ustilago Clintoniana** Ciferri, Ann. Myc. **26**: 64. 1928.

Ustilago violacea var. *major* Clinton, Jour. Myc. **8**: 139. 1902. (Described under this name on page 21.)

62b. **Ustilago Alsineae** Clinton & Zundel, sp. nov.

Sori in the ovaries, but apparently confined to the ovules, ovoid to ellipsoid and about 2 or 3 mm. in length, dehiscing peculiarly and disclosing dusty purple-black spore-masses in place of the seeds; spores dark-purple, often subopaque, subspheric to spheric, with obscure very minute and shallow reticulations (about 1 μ in diameter), showing at the margin as rather inconspicuous papillae, chiefly 10–14 μ in diameter. (See page 1029.)

ON CARYOPHYLLACEAE:
Alsine nitens, Washington (not *Ustilago violacea* as reported).
Alsine praecox, Idaho.
Type collected at Falk's Store, Idaho, April 22, 1911, on *Alsine praecox* (*Stellaria praecox*) A. Nelson.
DISTRIBUTION: Idaho and Washington.
NOTE: If *Ustilago Duriaeana* Tul. on *Cerastium* and *Arenaria*, and *Ustilago Holostei* DeBary on *Holosteum* are distinct species, then the above is also distinct, as it differs from either of them more than they do from each other. Yet these three seed-inhabiting species are certainly very closely related, and the slight differences may even be due to the hosts. Our species differs decidedly from *U. Duriaeana*, but perhaps less decidedly from *U. Holostei*, in its dark or black-purple spores, while these other species in all of the specimens examined have lighter reddish-purple spores. Its spores also, on the whole, are smaller, more regular, and with more minute reticulations that extend out at the margins as inconspicuous papillae rather than as wings, especially as compared with *U. Holostei*. It is entirely distinct from *Ustilago violacea* and its related forms that occur in the anthers of similar hosts. Nelson writes: "I find that we have abandoned *S. praecox* as a species, reaching the conclusion that its peculiarities represented abnormalities due to seed-infection."

62c. **Ustilago Duriaeana** Tul. Ann. Sci. Nat. III. **7**: 105. 1847.

Sori in the ovary, destroying the ovules and funiculi and possibly the placentae, showing as a dusty or agglutinated, purplish spore-mass; spores light-purple to dark-purple, chiefly subspheric to spheric, with evident small to medium reticulations showing somewhat winged at margins, 10–15 μ in diameter.

ON CARYOPHYLLACEAE:
Cerastium viscosum, Oregon.
TYPE LOCALITY: Mauritania, Africa, on *Cerastium glomeratum*.
DISTRIBUTION: Northwestern United States; also in Europe and Africa.
ILLUSTRATIONS: Ann. Sci. Nat. III. **7**: *pl. 5, f. 32;* Bref. Unters. Gesammt. Myk. **12**: *pl. 8, f. 35;* Verh. Zool.-Bot. Ges. Wien **46**: *pl. 7, f. 6–17.*
NOTE: This species differs from *Ustilago Alsineae* in its lighter-colored spores and more evident winged reticulations. Our Oregon specimen (in Zundel Herbarium), while meager and past its prime, agrees with European specimens on *Cerastium semidecandrum*.

21. **Ustilago Gayophyti.**

Add, under ONAGRACEAE:

**Gayophytum intermedium*, Utah.

21. Insert:

63a. **Ustilago Claytoniae** Shear, Bull. Torrey Club **34**: 317. 1907.

Sori in the seeds, concealed at first by the ovary, which on splitting open show one or more ellipsoid, semi-agglutinated to dusty, purple-black spore-masses, about 1 mm. in

diameter; spores ellipsoid or ovoid to chiefly subspheric or spheric, dark-purple, with minute mostly regular reticulations (1 or 2 μ) showing on the margin as more or less conspicuous coarse-ribbed wings, 12–16 μ, rarely 18 μ in length.

ON PORTULACACEAE:
Claytonia linearis, Washington.
TYPE LOCALITY: Vancouver Barracks, Washington, on *Claytonia linearis*.
DISTRIBUTION: Washington.
NOTE: This lies between *Ustilago Gayophyti* and *U. Calandriniae*, and is not very different from the latter. Further study may show they are the same.

22. **Ustilago Calandriniae.**

Add, under PORTULACACEAE:

**Oreobroma nevadense* (*Calandrinia nevadensis*, *Lewisia nevadensis*), California. (On this specimen the reticulations do not project quite as far as on some of the other specimens.)

22. **Ustilago anomala.**

Add, under POLYGONACEAE:

Bilderdykia cilinodis (*Tiniaria cilinodis*, *Polygonum cilinode*), Connecticut, Massachusetts, Pennsylvania; Manitoba, Ontario.
Bilderdykia Convolvulus (*Tiniaria Convolvulus*, *Polygonum Convolvulus*), South Dakota; Alberta, Ontario.
**Bilderdykia dumetorum* (*Tiniaria dumetorum*, *Polygonum dumetorum*), Pennsylvania.
Bilderdykia scandens (*Tiniaria scandens*, *Polygonum scandens*), New Jersey, New York.
**Tovara virginiana* (*Polygonum virginianum*), Quebec.

22. **Ustilago utriculosa.**

Add, under POLYGONACEAE:

Persicaria Careyi (*Polygonum Careyi*), Wisconsin.
Persicaria Hydropiper (*Polygonum Hydropiper*), Maryland, Massachusetts.
Persicaria hydropiperoides (*Polygonum hydropiperoides*), Indiana, Washington; Nova Scotia.
Persicaria lapathifolia (*Polygonum lapathifolium*), Indiana, Maryland, Michigan, Missouri, North Dakota, Pennsylvania; Alberta, Manitoba, Nova Scotia, Quebec.
**Persicaria mitis* (*P. Persicaria*, *Polygonum Persicaria*), Indiana, Iowa, Minnesota, Oregon; Ontario.
**Persicaria Muhlenbergii* (*Polygonum Muhlenbergii*, *P. emersum*), Florida.
Persicaria pennsylvanica (*Polygonum pennsylvanicum*), Florida, Indiana, Maryland, Pennsylvania, Virginia, Wisconsin; New Brunswick.
Persicaria punctata (*Polygonum punctatum*, *P. acre*), Delaware, Michigan.
Persicaria sp. (*Polygonum* sp.), Oregon, Texas; Canada.
Traucaulon sagittatum (*Polygonum sagittatum*), Nova Scotia.

Add the illustration: Beitr. Krypt. Schweiz **3**^{2}: *f. 31.*

Add the exsiccati: Barth. Fungi Columb. *2298*, *2600;* Brenckle, Fungi Dak. *550;* Sydow, Ust. *408.*

23. **Ustilago Rumicis.**

Add, under POLYGONACEAE:

Rumex hastatulus, Florida. (In this specimen the sori occur in the leaves and stems as well as in the inflorescence, so there is some question whether *Ustilago Rumicis* is really distinct from *U. Parlatorei*.)

23. **Ustilago Parlatorei.**

Insert: ILLUSTRATION: Beitr. Krypt. Schweiz **3**^{2}: *f. 22.*

23. **Ustilago Piperii.**

Add, under POLYGONACEAE:

**Polygonum* sp., Nevada.

23. **Ustilago punctata.**

Add, under POLYGONACEAE:

**Aconogonum phytolaccaefolium* (*Polygonum alpinum*), Oregon, California.

Add the note: *Sphacelotheca alpinum* Schellenb. is apparently very close to this species. The Oregon specimen has sori on both the inflorescence and the leaves, and the California one on the leaves and apparently in the aborted inflorescence. There seems to be no reason for considering the American specimens a *Sphacelotheca.*

24. **Ustilago Bistortarum.**

Add the synonyms: *Ustilago marginalis* Lév. Dict. Univ. Hist. Nat. **12**: 778. 1848. *Ustilago pustulata** (Wint. Hedwigia **19**: 109; hyponym. 1880) Bubák; Vesterg. Micr. Rar. Sel. *336.* 1900. (Houby České **2**: 17. 1912.)

Add the illustrations: Beitr. Krypt. Schweiz 3^2: *f. 18;* Arch. Nat. Land. Böhmen 15^3: *f. 8.*

24. Insert the excluded species:

Ustilago Festucae Zundel, Mycologia **25**: 352. 1933. On *Festuca Kingii.* Further study has shown this species to be *Ustilago perennans* on *Arrhenatherum elatius.*

24. Insert:

1a. FARYSIA Racib. Bull. Acad. Cracovie 1909^1: 354. 1909.

Elateromyces Bubák, Houby České **2**: 32. 1912.

Sori in various parts of the host, at maturity forming dusty, usually dark spore-masses, intermixed with parallel, elatior-like strands of host-tissue and sterile hyphae; spores single, produced as in *Ustilago* but intermixed with sterile hyphae and strands of host-tissue which function as elaters.

Type, *Ustilago javanica* Racib.

1. **Farysia olivacea** (DC.) Sydow, Ann. Myc. **17**: 41. 1919.

Uredo olivacea DC. Fl. Fr. **6**: 78. 1815.
Caeoma olivaceum Schlecht. Fl. Berol. **2**: 130. 1824.
Erysibe olivacea Wallr. Fl. Crypt. Germ. **2**: 215. 1833.
Ustilago olivacea Tul. Ann. Sci. Nat. III. **7**: 88. 1847.
Ustilago catenata F. Ludwig, Zeits. Pflanzenkr. **3**: 139. 1893.
Cintractia caricicola P. Henn. Hedwigia **34**: 325. 1895.
Ustilago subolivacea P. Henn. Atti Ist. Bot. Roma **6**: 84. 1896.
Ustilago caricicola Tracy & Earle, Bull. Torrey Club **26**: 493. 1899.
Elateromyces olivacea Bubák, Houby České **2**: 32. 1912.
Stilbella olivacea Jaap, Ann. Myc. **14**: 43. 1916.
Farysia olivacea Höhnel, Ann. Myc. **15**: 293. 1917.
Farysia americana Ciferri, Ann. Myc. **29**: 73. 1931.

Sori in occasional ovaries, at first partly concealed by perigynium, ovate, 2–6 mm. in diameter, at first with agglutinated spores which later become powdery, with conspicuous elater-like threads intermixed with the spores; spores olivaceous-brown, irregular, varying from globose to oblong or linear but sometimes more regular and then 7–9 μ in length, the most elongate about 12 μ in length and about 4 μ in width, abundantly but minutely verruculate.

ON CYPERACEAE:
Carex lonchocarpa (*C. folliculata* var. *australis*), Mississippi.
Carex polystachya (*C. cladostachya*), Mexico.
**Carex Pseudo-Cyperus*, Santo Domingo.
**Carex rostrata* (*C. utriculata*), California, Pennsylvania, Washington, Wisconsin.
Carex turgescens, Florida.
Carex sp., Guatemala; Mexico; Jamaica.

* Winter, although he mentioned this name, did not consider it as distinct from *U. Bistortarum*, but Bubák did. See note under *Ustilago togata* (*U. pustulata*), page 986.

TYPE LOCALITY: France, on *Carex riparia*.
DISTRIBUTION: Pennsylvania to Washington; Mexico; Guatemala; Jamaica; Santo Domingo; also in South America, Europe, and Asia.
ILLUSTRATIONS: Bref. Unters. Gesammt. Myk. 5: *pl. 10, f. 9–26;* Bull. Soc. Nat. Mosc. 40[1]: *pl. 3, f. 11.*

25. **Sphacelotheca Sorghi.**

Add to description: sterile membrane breaking up into chains of small hyaline sterile cells.

Add, under POACEAE:

Sorghum halepense, Arkansas, Texas, Utah.
**Sorghum sudanense*, Iowa, Kansas, Washington.
Sorghum vulgare, Colorado, Georgia, Indiana, Maryland, Mississippi, Missouri, Montana, New Mexico, North Carolina, North Dakota, Oregon, Pennsylvania, Tennessee, Texas, Utah, Virginia, Washington; Manitoba; Puerto Rico.
**Sorghum vulgare* var. *caffrorum*, Connecticut, Pennsylvania; Quebec.
**Sorghum vulgare* var. *Durra*, Kansas, Virginia.
**Sorghum vulgare* var. *Roxburghii*, Texas.
**Sorghum vulgare* var. *saccharatum*, Colorado, Connecticut, Utah.
**Sorghum vulgare* var. *technicum*, Connecticut, District of Columbia, Pennsylvania, Washington; Ontario.
**Sorghum* sp., Arizona.

25. Insert:

1a. **Sphacelotheca cruenta** (Kühn) A. Potter, Phytopathology 2: 98. 1912.

Ustilago cruenta Kühn, Hamb. Gartenz. 28: 178. 1872.

Sori confined mostly to the ovaries, ovate, about the size of the normal mature seed, covered by a very delicate membrane which easily ruptures revealing a dark-brown dusty spore-mass surrounding a well-developed columella; sterile cells of membrane breaking up into groups, large, thin-walled, ovoid, hyaline, 9–19 μ in length; spores olivaceous-brown, spheric to ovoid, slightly irregular, somewhat granular, chiefly 5.5–8 μ in length.

ON POACEAE:
Sorghum vulgare, Arkansas, Kansas, Oklahoma, Tennessee, Texas, Wisconsin; Cuba, Haïti, Jamaica.
DISTRIBUTION: Arkansas to Wisconsin and the West Indies; also in Europe.
ILLUSTRATIONS: Jour. Agr. Res. 2: *pl. 32, f. 1a;* Phytopathology 5: *pl. 10, f. 1–4.*

25. **Sphacelotheca Seymouriana.**

Add, under POACEAE:

**Andropogon ternarius*, Georgia, North Carolina, Virginia.
**Schizachyrium scoparium* (*Andropogon scoparius*), Virginia.

26. **Sphacelotheca monilifera.**

Add, under POACEAE:

**Andropogon glomeratus*, Virginia.

27. **Sphacelotheca diplospora** var. **verruculosa.**

Add, under POACEAE:

**Brachiaria Meziana*, Distrito Federal. (This host appears to be the same as the type host.)

27. Insert:

6a. **Sphacelotheca veracruziana** Zundel & Dunlap, sp. nov.

Sori filling the ovaries, ovoid, chiefly 1–2 mm. in diameter, covered with a prominent thick false irregularly dehiscent membrane; spore-mass powdery, black-brown, surrounding a large globose columella; sterile cells of membrane variable in shape and size, firmly adhering together, the cells of the interior often in pairs, hyaline, thick-walled, angular, subspheric, smaller than the spores; spores with a tendency to agglutinate, reddish-brown, ovoid to ellipsoid, coarsely verruculose, chiefly 8–13 μ in length. (See page 1029.)

ON POACEAE:
Panicum viscidellum, Vera Cruz.
Type collected at Jalapa, Vera Cruz, at an altitude of about 1400 meters, on *Panicum viscidellum*, September 2–4, 1910, by A. S. Hitchcock (*no. 6606*).
DISTRIBUTION: Mexico.

27. **Sphacelotheca pamparum.**

Add, under POACEAE:

**Chaetochloa geniculata* (*Setaria geniculata*), Bermuda.

Add the note: Ciferri (Trans. Brit. Myc. Soc. **18**: 262–263. 1934) states that this smut is identical with *Tilletia Magnusiana* Fisch. de Waldh., but transfers it to *Sphacelotheca Magnusiana* (Fisch. de Waldh.) Ciferri. Seymour (Farl. & Seym. Host-Index N. Am. Fungi 94) lists *Tilletia Magnusiana* Fisch. de Waldh. on *? Panicum geniculatum*. The authors have accepted these identifications but they have seen no specimens of this smut from North America, nor other evidence to verify the above statements.

27. Insert:

7a. **Sphacelotheca Penniseti-japonici** (P. Henn.) S. Ito, Trans. Sapporo Nat. Hist. Soc. **14**: 91. 1935.

Ustilago Penniseti-japonici P. Henn. Hedwigia **43**: 140. 1904.

Sori in the ovaries of all the spikelets, forming linear bodies extending between the glumes, about 6–10 mm. in length, rupturing from apex and with the gradual flaking away of the false membrane and semi-agglutinated black-brown spore-mass disclosing a distinct columella, often breaking up into four slender rigid threads; false membrane rather permanently united at base but finally separating into slender hyaline threads composed of oblong cells, often guttulate and narrower than the spores; spores reddish-brown, distinctly granular-verruculose, subspheric to spheric, or occasionally more elongate and angular, 10–15 μ in length.

ON POACEAE:
Pennisetum alopecuroides (*P. japonicum*), Virginia.
TYPE LOCALITY: Tokyo, Japan, on *Pennisetum japonicum*.
DISTRIBUTION: Virginia; also in Asia.
NOTE: Reported from this country only from Arlington Farm of the United States Department of Agriculture on a collection made by C. V. Piper, October 11, 1915. Although closely related to *Ustilago Penniseti* Rab., it differs in the slightly larger spores which are distinctly granular-verruculose. It is even more closely related to, if not identical with, *Ustilago Pappiana* Bacc., which despite the original description has spores granular-verruculose under an immersion-lens though the sorus seems to be shorter and more globose. *Ustilago Schefferi* Sydow is also closely related but infects the entire inflorescence. All four smuts have *Pennisetum* species for their hosts and at least *U. Pappiana* and *U. Penniseti* seem to be species of *Sphacelotheca*. We have not seen *Ustilago kamerunensis* Sydow also on *Pennisetum*, but the spores are described as considerably smaller, 6–8 μ. *Tolyposporium Pennicillariae* Bref. on *Pennisetum* (*Pennicillaria*) is quite distinct.

27. **Sphacelotheca occidentalis.**

Add, under POACEAE:

Andropogon furcatus, Colorado, Indiana, Oklahoma, South Dakota; Manitoba.
Andropogon Hallii, North Dakota.
**Schizachyrium scoparium* (*Andropogon scoparius*), Virginia.
**Sorghum vulgare*, Haïti.

Add the exsiccati: Barth. Fungi Columb. *3388;* Brenckle, Fungi Dak. *421.*

27. Insert:

8a. **Sphacelotheca panamensis** Zundel & Dunlap, sp. nov.

Sori in the ovaries, slightly shorter than and hidden by enveloping glumes, about 3 mm. in length, linear, at first covered by a definite false membrane which disappears, disclosing the dusty spore-mass and finally the slender-pointed columella; sterile membrane rather loosely bound together, easily separating into subspheric or spheric hyaline cells about the same size as the spores or slightly larger; spores reddish-brown, thin-walled,

rather regular, chiefly subspheric or spheric, apparently smooth but under an immersion-lens, at least at times, minutely granular, 14–18 μ in diameter. (See page 1029.)

ON POACEAE:
Cymbopogon sp., Panama.
Type collected near El Bogrete, Prov. Cherique, Panama, September–October 1911, by A. S. Hitchcock.
NOTE: The meager type specimen was labeled "*Ustilago spermoidea* Berk. & Br.?" by Diehl, but it does not agree with that species, which is also a *Sphacelotheca*, or with any of the smuts we have seen so far on either *Cymbopogon* or *Andropogon*. Both the large regular spores and the sori combined with the ovaries distinguish it from these species. (U. S. Nat. Herb. *925602*.) The description was written by Dr. Clinton, without a specific name.

27. **Sphacelotheca Ischaemi.**

Add, under POACEAE:

**Andropogon barbinodis*, Aguas Calientes, Chihuahua, San Luis Potosí.
Andropogon furcatus, South Dakota, Tennessee.
**Andropogon pertusus* var. *panormitanus*, St. Croix; Barbados.
Andropogon saccharoides, Arizona, California (Santa Catalina Island).
**Andropogon* sp., North Carolina.
Schizachyrium scoparium (*Andropogon scoparius*), New Jersey, Virginia.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 33*.

Add the note: Part of the specimens on *Andropogon barbinodis* involve the entire inflorescence, forming the normal linear sori, and others only partially destroy it, sometimes being confined to the individual spikelets and forming more irregular or shorter and broader sori. The collection from Aguas Calientes was unusual in that the packet contained not only this species but also *Sphacelotheca Andropogonis-hirtifolii* (P. Henn.) Clinton, distinguishable by the larger spores with more evident verruculations under an immersion-lens. That the two species are closely related and difficult to distinguish (and yet they seem quite distinct when the spores are mixed together on a slide under the microscope) is shown by both species having not only this host but also *Andropogon saccharoides*, if these hosts have been correctly determined. The specimen on the latter host listed from Arizona in our monograph of Ustilaginales, under *S. Andropogonis-hirtifolii*, we have now decided belongs here, though the two specimens from Mexico on the same host do not.

28. Insert:

9a. **Sphacelotheca erythraeensis** (Sydow) Clinton.

Ustilago erythraeensis Sydow, Ann. Myc. **9**: 144. 1911.

Sori in the inflorescence, not wholly hidden by the enveloping leaf-sheaths, oblong-linear, about 1 cm. in length, protected by a definite false membrane which breaks away from the top disclosing the brown-black semi-agglutinated or dusty spore-mass and finally the distinct columella of plant-tissue; sterile cells scattered somewhat in subspheric groups within the spore-mass, those of the false membrane cohering rather permanently or separating somewhat upon pressure into threads of two to several cells in a row, hyaline, subspheric, about the size of the spores; spores chiefly subspheric or spheric, light-reddish-brown, when young apparently smooth but with age distinctly minutely-verruculose, 10–12 μ in diameter.

ON POACEAE:
Hackelochloa granularis (*Manisuris granularis*), Arizona; Guerrero.
TYPE LOCALITY: Eritrea, northern Africa.
DISTRIBUTION: Arizona; Guerrero; also northern Africa.
NOTE: This species, collected first by Griffith & Thornber in Arizona, and later by Hitchcock in Balsas, Guerrero, Mexico, agrees with specimens of Sydow's *Ustilago erythraeensis* as issued in his Ustilagineen (*451*), though the spore-measurements given in his description are slightly smaller than we make them from his own specimen. The American specimens are younger and the spores are therefore apparently smooth though the verruculations can be seen indistinctly with an immersion-lens. Hitchcock in his Mexican grasses places this host under the genus *Rytilix*. The evident false-membrane, with the distinct sterile cells within the spore-mass, places the fungus, under our system, in the genus *Sphacelotheca*, to which we have transferred it here.

9b. **Sphacelotheca culmiperda** (Schroet.) Clinton; Zundel, Mycologia **22**: 143. 1930.

Ustilago culmiperda Schroet.; P. Henn. Hedwigia **35**: 212. 1896.

Sori in the inflorescence, entirely aborting it and so appearing as if on the stem, at first enclosed in the leaf-sheaths but finally more or less exposed, showing as linear bodies 2–5 cm. in length, protected by a prominent light-colored false-membrane which gradually wears away revealing a black dusty spore-mass that becomes dissipated and leaves behind only a prominent columella of plant-tissues; sterile cells of membrane cohering rather permanently but upon pressure separating somewhat into threads, cubic to more elongate and often somewhat rounded at the ends, eventually semigelatinized, smaller than the spores; spores dark-reddish-brown, subopaque, chiefly subspheric to spheric, regular though often cupped on one side, and so somewhat flattened-elliptic in side view, with apparently smooth wall (about 1 μ thick) but under an immersion-lens minutely granular-verruculate, chiefly 15–18 μ or rarely 14–21 μ in diameter.

ON POACEAE:
Andropogon bicornis, Vera Cruz.
TYPE LOCALITY: Joinville, Santa Catharina, Brazil.
DISTRIBUTION: Vera Cruz; also in Brazil.
NOTE: The specimen from Mexico is entirely distinct from *Ustilago bicornis* P. Henn. on the same host from Brazil. It does agree, however, with *Ustilago culmiperda* Schroet. as described by Hennings, which was also on this host from Brazil, and with the co-type specimen collected by Ule. We could find no evidence in either of these mature specimens that the spores are formed in balls, as in *Sorosporium*, and we have no hesitation in placing it in the genus *Sphacelotheca* because of the prominent false membrane. It has the largest spores of any of our species, so far placed under this genus. It is very close to if not identical with *Sphacelotheca* (*Ustilago*) *leucostachys* P. Henn. on *A. leucostachys*, but differs in being granular-verruculate instead of apparently smooth under an immersion-lens.

9c. **Sphacelotheca Kellermanii** Clinton & Zundel; Zundel, Mycologia **22**: 142. 1930.

Sori in the inflorescence, bunched and forming witches-broom effect, but individual sori linear elongate, usually 2–4 cm. in length; sterile membrane conspicuous, breaking irregularly into elongate strips (disclosing dusty spore-mass and eventually the elongate recurved columella of plant-tissues) but not separating easily into the individual cells (hyaline to reddish-brown tinted), these chiefly oblong to cubic and smaller than the spores; spores dark-reddish-brown, subopaque, angular, irregularly oblong to subspheric, distinctly granular-verruculate under an immersion-lens, 10–16 μ, rarely 18–20 μ in length.

ON POACEAE:
Andropogon leucostachys, Guatemala.
TYPE LOCALITY: Los Amates, Guatemala, on *Andropogon leucostachys*.
DISTRIBUTION: Guatemala.
NOTE: This species is closely related to *Sphacelotheca Holwayi* Clinton & Zundel (Bolivia) on *Andropogon bicornis*, but differs in the occasionally more elongate spores and in the more evident granular-verruculations. It is even more distinct from *Sphacelotheca* (*Ustilago*) *leucostachys* on the same host since the latter has quite regular, subspheric, larger spores and a simple sorus. This description is based on three collections made by W. A. Kellerman in Los Amates, Guatemala, March 15, 1905, and January 15 and February 15, 1908. The host was determined by Agnes Chase.

28. **Sphacelotheca Paspali-notati.**

Add, under POACEAE:

**Paspalum* sp., Puerto Rico.

28. Insert:

10a. **Sphacelotheca Panici-miliacei** (Pers.) Bubák, Houby České **2**: 27. 1912.

Uredo (*Ustilago*) *segetum* var. *Panici-miliacei* Pers. Syn. Fung. 224. 1801.
Uredo (*Ustilago*) *segetum* var. *Panici* Alb. & Schw. Consp. Fung. 130. 1805.
Uredo carbo var. *Panici-miliacei* DC. Fl. Fr. **6**: 76. 1815.
Caeoma destruens Schlecht. Fl. Berol. **2**: 130. 1824.
Uredo destruens Duby, Bot. Gall. 901. 1830.

Erysibe Panicorum var. *Panici-miliacei* Wallr. Fl. Crypt. Germ. **2**: 216. 1833.
Ustilago Carbo var. *destruens* Tul. Ann. Sci. Nat. III. **7**: 81. 1847.
Tilletia destruens Lév. Ann. Sci. Nat. III. **8**: 372. 1847.
Ustilago destruens Schlecht.; Rab. in Klotzsch, Herb. Viv. Myc. ed. 2. *400*. 1856.
Ustilago Panici-miliacei Wint. in Rab. Krypt.-Fl. **1**: 89. 1884.
Sorosporium Panici-miliacei Tak. Bot. Mag. Tokyo **16**: (247). 1902.

Sori in the inflorescence, completely destroying it, at first concealed by leaf-sheaths but eventually more or less exposed, about 3–6 cm. in length by 0.5–2 cm. in width, with an evident whitish false membrane that gradually flakes away revealing a dusty black-brown spore-mass and numerous strands of plant-tissue; sterile cells of false membrane cohering rather firmly, hyaline, angular, usually mostly elongate with the shorter diameter smaller than the spores; spores light-reddish-brown, broadly ovate to chiefly subspheric or spheric, usually smooth, chiefly 7–10 μ in length, or rarely longer.

ON POACEAE:
Panicum miliaceum, Colorado, North Dakota, Oregon, Washington, Wisconsin; Manitoba, Ontario, Saskatchewan, Quebec.
TYPE LOCALITY: Europe, on *Panicum miliaceum*.
DISTRIBUTION: Western United States and western Canada; Ontario and Quebec; Europe, Asia, Tripoli, Australia, and Philippine Islands.
ILLUSTRATION: Arch. Nat. Land. Böhmen **15**[3]: *f. 11*.
EXSICCATI: Brenckle, Fungi Dak. *91*.
NOTE: We find some variations in the size and markings of certain specimens on this host from America; at first this led us to place some of them under *Sorosporium Syntherismae*, which it very closely resembles. But upon further examination we found it difficult to draw the deciding line, and in the end we placed them all together here. The abnormal specimens usually have larger more irregular spores and under an immersion-lens often show more or less evident indications of verruculations in their walls.

10b. **Sphacelotheca Digitariae** (Kunze) Clinton.

Uredo Digitariae Kunze; Holl, Flora **13**: 369. 1830.
Ustilago Digitariae f. *Panici-repentis* Kühn, Hedwigia **15**: 5. 1876. (Rab. Fungi Eur. *2099, f. 11.*)
Ustilago pallida Körn. Hedwigia **16**: 34. 1877.
Ustilago Digitariae Wint. in Rab. Krypt.-Fl. **1**[1]: 88. 1881.

Sori in the inflorescence, protruding more or less from the leaf-sheaths as elongate bodies 4–8 cm. in length, covered at first by the false membrane, which soon flakes away revealing a dark-brown dusty spore-mass and numerous elongate shreds of plant-tissues; sterile cells cohering rather permanently, hyaline, cubic to elongate, sometimes slightly rounded and with their shorter diameter about the diameter of the spores; spores light-reddish-brown, subspheric, or occasionally more irregular or elongate, smooth, chiefly 6–8 μ or rarely 5–9 μ in diameter.

ON POACEAE:
Syntherisma (*Digitaria*) sp., Mexico; Jamaica.
TYPE LOCALITY: Near Triest, Italy, on *Digitaria sanguinalis*.
DISTRIBUTION: Europe, India, Egypt, Mexico (Mexican specimen collected at Popo Park, Mexico (state), August 4–8, 1910, by A. S. Hitchcock).
ILLUSTRATION: Beitr. Krypt. Schweiz **3**[2]: *f. 7*.
NOTE 1: Specimens labeled *Ustilago Digitariae* in Rab. Fungi Eur. *2094* and Thüm. Myc. Univ. *1419* are not this species but *Ustilago Rabenhorstiana*.
NOTE 2: Körnicke speaks of the panicles as sometimes being only partially destroyed and bearing spikelets but in none of the specimens seen by us was this the case. This fungus differs distinctly from *Ustilago Rabenhorstiana* on the same hosts, in the smaller smooth spores and the presence of the false membrane, which, in our treatment of the smuts, places it in the genus *Sphacelotheca*. It is very closely related, however, to *Sphacelotheca* (*Ustilago*) *Panici-miliacei* and *S. Panici-leucophaei*, being perhaps intermediate and hardly to be told from them by the spore-characters. In young stages, the spores often adhere loosely in irregular clusters but not in such a definite manner as to place it under *Sorosporium*.

28. **Sphacelotheca Panici-leucophaei.**

Reduce this name to synonymy, and substitute: **Sphacelotheca cordobensis** (Speg.) H. S. Jackson, Jour. Dep. Agr. P. Rico **14**: 298. O 1930.

Add the synonyms: *Ustilago cordobensis* Speg. Anal. Soc. Ci. Argent. **12**: 64. 1881. *Ustilago cacheutensis* Speg. Anal. Mus. Nac. Buenos Aires III. **12**: 293. 1909. *Sphacelotheca cordobensis* Ciferri, Ark. Bot. **23A**[14]: 16. 1931.

Add, under POACEAE:

Trichachne insularis (*Panicum leucophaeum*), Santo Domingo and Haïti; Martinique.

Add the exsiccati: Ciferri, Myc. Doming. Exs. *2*.

28. **Sphacelotheca Andropogonis-hirtifolii.**

Add, under POACEAE:

**Andropogon barbinodis*, Aguas Calientes.

29. **Sphacelotheca montaniensis.**

Add, under POACEAE:

Muhlenbergia racemosa (*M. glomerata*), North Dakota.

Add the exsiccati: Brenckle, Fungi Dak. *190;* Sydow, Ust. *484*.

29. **Sphacelotheca strangulans.**

Add, under POACEAE:

**Eragrostis diffusa*, Arizona.

29. **Sphacelotheca Reiliana.**

Becomes a synonym of **Sorosporium Reilianum** (see page 1005).

30. **Sphacelotheca Hydropiperis.**

Add the synonym: *Sphacelotheca granosa* Liro, Ann. Acad. Sci. Fenn. A. **17**: 48. 1924.

Add, under POLYGONACEAE:

**Bistorta vivipara* (*Polygonum viviparum*), Ellesmere Land.
Persicaria Hydropiper (*Polygonum Hydropiper*), Maine; Quebec.
Persicaria hydropiperoides (*Polygonum hydropiperoides*), Maine, Oregon, Washington; Nova Scotia.
Persicaria punctata (*Polygonum punctatum, P. acre*), Pennsylvania.
Persicaria sp. (*Polygonum* sp.), Michigan, Oregon.
Tracaulon sagittatum (*Polygonum sagittatum*), New Hampshire, New Jersey, Pennsylvania, Wisconsin; Nova Scotia.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 35a, 35b, 35c;* Arch. Nat. Land. Böhmen **15**[3]: *f. 12*.

30. Insert:

16a. **Sphacelotheca inflorescentiae** (Trel.) Jaap, Ann. Myc. **6**: 194. 1908.

Ustilago Bistortarum var. *inflorescentiae* Trel. Harriman Alaska Exp. Crypt. 35. 1904.
Ustilago inflorescentiae Maire; Brockm.-Jer. & Maire, Oesterr. Bot. Zeit. **57**: 273. 1907.
Sphacelotheca Polygoni-viviparum Schellenb. Ann. Myc. **5**: 388. 1907.

Sori in the flowers, infecting all, enwrapped by floral envelopes, covered by a delicate membrane which ruptures disclosing a dusty dark-purple spore-mass surrounding a small columella; sterile cells of membrane easily breaking up into single cells, ovoid to ovate, hyaline, thick-walled, chiefly about the size of the spores; spores light-purple to dark-purple, usually chiefly subspheric to spheric, occasionally somewhat angled or irregularly elongate, thick-walled, granular to minutely verruculate, chiefly 10–14 μ, rarely up to 17 μ in length.

ON POLYGONACEAE:
Bistorta bistortoides (*Polygonum bistortoides*), Washington.
Bistorta vivipara (*Polygonum viviparum*), Colorado, Wyoming; Alaska; Greenland.
TYPE LOCALITY: Unalaska, Alaska, on *Polygonum viviparum*.
DISTRIBUTION: Alaska to Colorado and Greenland; also in Europe.
NOTE: This was treated on page 24 as *Ustilago Bistortarum* var. *inflorescentiae*.

16b. **Sphacelotheca borealis** (Clinton) Schellenb. Ann. Myc. **5**: 386. 1907.

Sphacelotheca Hydropiperis var. *borealis* Clinton, Proc. Boston Nat. Hist. **31**: 395. 1904.

Sori in the ovaries, forming oblong or ovate bodies, 3–4 mm. in length, protected by floral envelopes at base, with false membrane dehiscing at apex, revealing a dark-purple spore-mass and a well-developed robust columella; sterile cells hyaline or slightly tinted, subspheric, thick-walled, chiefly slightly larger than the spores; spores violet-purple, ovoid to spheric or occasionally more irregular, often apparently smooth but really minutely granular, chiefly 9–11 μ in length.

ON POLYGONACEAE:
Bistorta bistortoides (*Polygonum bistortoides*), Colorado, Washington, Wyoming.
Persicaria (*Polygonum*) sp., California, Oregon; Nova Scotia.
TYPE LOCALITY: Mt. Rainier, Washington, on *Polygonum bistortoides*.
DISTRIBUTION: Washington and California to Colorado; Nova Scotia; also in Switzerland.
ILLUSTRATION: Beitr. Krypt. Schweiz **3**[2]: *f. 36*.
NOTE: Treated on page 30 as *S. Hydropiperis* var. *borealis*.

30. **Melanopsichium austro-americanum.**

Add the synonym: *Sphacelotheca austro-americanum* (Speg.) Liro, Ann. Acad. Sci. Fenn. A. **17**: 150. 1924.

Add, under POLYGONACEAE:

Persicaria lapathifolia (*Polygonum lapathifolium*), Iowa, Kansas, Maryland, Missouri, New York, Ohio, Oklahoma.
Persicaria pennsylvanica (*Polygonum pennsylvanicum*), Connecticut, Indiana, Maryland.
Persicaria sp. (*Polygonum* sp.), Kentucky, Oklahoma.

Add the note: An unusual form of this smut, on *Persicaria pennsylvanica*, in which the sori are on the stems and roots, was collected by Clinton on the farm of S. D. Woodruff & Sons, South Orange, Connecticut. P. Wilson collected specimens of this smut on *P. lapathifolia*, in which the sori were on the stems of the host, at the New York Botanical Garden.

31. **Cintractia Montagnei.**

Add the synonyms: *Cintractia Rhynchosporae* Ciferri, Ark. Bot. **23A**[14]: 9. 1931. *Cintractia Ekmani* Ciferri, Ark. Bot. **23A**[14]: 11. 1931. *Cintractia eximia* Ciferri, Ark. Bot. **23A**[14]: 12. 1931. *? Cintractia samanensis* Ciferri, Ark. Bot. **23A**[14]: 13. 1931.

Add, under CYPERACEAE:

**Rynchospora barbata*, Santo Domingo.
**Rynchospora capitellata*, New York.
**Rynchospora distans*, Bermuda.
Rynchospora eximia, Santo Domingo.
Rynchospora glomerata, Delaware, Indiana.
**Rynchospora Marisculus*, Santo Domingo.
Rynchospora miliacea, Florida.
*?*Rynchospora oliganiha*, Santo Domingo.
**Rynchospora podosperma*, Santo Domingo.
**Rynchospora stipitata*, Florida; Bermuda.

Add the illustrations: Ark. Bot. **23A**[14]: *pl. 1, f. 3; pl. 3, f. 9;* Beitr. Krypt. Schweiz **3**[2]: *f. 41*.

Add the exsiccati: Ciferri, Myc. Doming. Exs. *7, 8, 84*.

32. Insert:

1a. **Cintractia Farlowii** Clinton, sp. nov.

Sori in the ovaries, more or less completely hidden by the enveloping glumes, 1–2 mm. in diameter forming at first a semi-agglutinated but finally a dusty or semi-dusty black spore-mass; spores dark-reddish-brown, in front view semi-circular but in side view reniform with the lighter thinner side cupped, often appearing falsely two-celled by the dark curved line of the outer wall apparently curling at the edge of the lighter-cupped area, chiefly 10–12 μ in length. (See page 1029.)

ON CYPERACEAE:
Rynchospora glomerata, New Jersey.
Rynchospora glomerata leptocarpa, Florida (Fort Reed).
Rynchospora sp., Massachusetts.

Type collected at Magnolia, Massachusetts, by Cora H. Clarke (Clinton herbarium, from W. G. Farlow).

DISTRIBUTION: Massachusetts to Florida.

NOTE: This species was first collected September 27, 1911. Farlow, in sending the specimen to the writer in October, wrote: "I supposed it was the usual *Cintractia* on *Rynchospora* of which I found a solitary specimen at Chocoura this summer on *R. alba*, but the Magnolia specimen has different spores which do not seem to be arranged like those of *Cintractia*. They seemed at first to be arranged in twos but on further examination they seem rather to be lunate or crescentic spores which in drying have the ends rolled in so they meet and when seen in front view look like two spores adhering together." The spores give the impression of being those of a *Schizonella*, but a careful examination of the earliest stages shows that they have this cupped shape when still quite young, and there is no indication that two spores were originally found together and have fallen apart, as the cupped character might indicate. Furthermore, the young spores show the centripetal development of *Cintractia*. *C. Taubertiana* has spores about this size but more angular and without the peculiar cupping. *C. Leveilleana* R. Maire and *C. amazonica* Sydow on *Rynchospora* species are also different, judging from the descriptions.

32. Cintractia Taubertiana.

Add, under CYPERACEAE:

Rynchospora alba, New York, Pennsylvania.
**Rynchospora fusca*, New York.
Rynchospora sp., Delaware.

32. Cintractia Psilocaryae.

Add, under CYPERACEAE:

Psilocarya scirpoides, Indiana, Michigan.

32. Insert:

3a. **Cintractia arctica** Lagerh.; Vesterg. Micr. Rar. Sel. *182*. 1899; Bot. Notiser **1900**: 30. 1900.

Sori on the leaves and culms as long striae often coalescing so as to cover the entire leaf-surface, at first covered by a delicate whitish membrane, which disintegrates revealing a black semi-agglutinated spore-mass; spores dark-reddish-brown, opaque, reticulate, chiefly 13–15 μ in length, occasionally up to 17 μ.

ON CYPERACEAE:
Carex sp., Colorado, Utah.
TYPE LOCALITY: Tromsø, Norway, on *Carex canescens* and *Carex glareosa*.
DISTRIBUTION: Colorado, Utah; also in Norway and Sweden.
EXSICCATI: Sydow, Ust. *72, 73, 218, 312*.

32. Cintractia Cyperi.

Add, under CYPERACEAE:

**Cyperus cylindricus*, New Jersey.
Cyperus filiculmis, Massachusetts.
**Cyperus Grayii*, New Jersey.

32. Cintractia subinclusa.

Add, under CYPERACEAE:

**Carex atherodes*, British Columbia.
Carex lanuginosa, Saskatchewan.
**Carex stenophylla*, Colorado.
**Carex vesicaria* var. *monile* (*C. monile*), Ontario.
Carex sp., Manitoba, Quebec.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 42*.

33. Cintractia Caricis.

Add, under CYPERACEAE:

Carex acuta (*C. Goodenowii*), Quebec.
**Carex angustior* (*C. Leersii* var. *angustata*), New Hampshire.
Carex aquatilis, Alaska, Idaho, Michigan; British Columbia, Manitoba.
Carex arlitecta (*C. varia*), Maryland, Massachusetts; Manitoba.
**Carex atherodes*, Saskatchewan.
**Carex atrata*, Montana.

**Carex aurea*, Ontario, Quebec.
**Carex blanda* (*C. laxiflora* var. *blanda*), Indiana.
Carex Buxbaumii (*C. polygama*), Connecticut.
Carex concolor (*C. Bigelovii*, *C. rigida*), Quebec.
**Carex deflexa*, Colorado.
**Carex diandra*, Ontario.
Carex Douglasii, California.
Carex filifolia, Montana, Nebraska, North Dakota, Wyoming; Saskatchewan.
**Carex Geyeri*, Washington.
Carex gynocrates, Saskatchewan.
**Carex heliophila*, Colorado, Utah; Saskatchewan.
Carex interior, Maine; Alberta.
Carex lanceata (*C. salina*), Nova Scotia.
**Carex lasiocarpa* (*C. filiformis*), Montana; Ontario.
**Carex leptalea*, Michigan.
Carex limosa, Nova Scotia, Saskatchewan.
**Carex muricata* (*C. echinata*), Vermont; Quebec.
**Carex nebraskensis*, Montana.
**Carex obtusata*, Saskatchewan.
Carex paupercula, Quebec.
Carex pennsylvanica, Wisconsin.
Carex rostrata, Pennsylvania; Ontario.
**Carex stenophylla*, California, Colorado.
Carex stricta, Alaska, Connecticut; Quebec.
**Carex stricta* var. *angustata*, Ontario.
**Carex substricta*, Saskatchewan.
Carex tetanica, North Dakota.
Carex umbellata, Indiana.
Carex sp., New Mexico.
Kobresia Bellardi (*Elyna Bellardi*), Ellesmere Land.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 39;* Arch. Nat. Land. Böhmen **15**[3]: *f. 13.*

Add the exsiccati: Barth. Fungi Columb. *4908;* Brenckle, Fungi Dak. *452.*

Add the note: H. Sydow (Ann. Myc. **22**: 288, 289. 1924) divides *C. Caricis* into eleven species, ten on *Carex* and one on *Elyna*, and gives a type host for each. His species, hosts, and spore-measurements are:
Cintractia Caricis (Pers.) Magnus, on *Carex montana*, 14–18 by 13–16 μ;
Cintractia Caricis-albae Sydow, on *Carex alba*, 16–24 by 14–19 μ;
Cintractia angulata Sydow, on *Carex curta*, 18–25 by 13–19 μ;
Cintractia japonica Sydow, on *Carex capillacea*, 18–26 by 14–20 μ;
Cintractia baccata (Wallr.) Sydow, on *Carex praecox*, 15–19 by 12–16 μ;
Cintractia limosa Sydow, on *Carex limosa*, 17–26 by 14–21 μ;
Cintractia pratensis Sydow, on *Carex glauca*, 16–25.5 by 14–22 μ;
Cintractia turfosa Sydow, on *Carex dioica*, 19–25 by 14–19 μ;
Cintractia microsora Sydow, on *Carex remota*, 15–23 by 13–19 μ;
Cintractia arenaria Sydow, on *Carex arenaria*, 13–18 by 12–16 μ;
Cintractia Elynae Sydow, on *Elyna spicata*, 16–20 by 14–17 μ.

34. Cintractia externa.

Add, under CYPERACEAE:

Carex filifolia, Colorado, North Dakota; Saskatchewan.

Add the exsiccati: Barth. Fungi Columb. *4808;* Brenckle, Fungi Dak. *52.*

34. Cintractia Luzulae.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 43.*

34. Cintractia Junci.

Add, under CYPERACEAE:

Juncus bufonius, Pennsylvania.
**Juncus diffusissimus*, Indiana.
**Juncus Dudleyi*, New York.
Juncus tenuis, Delaware, District of Columbia, Indiana, Maryland, Virginia.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 44.*
Add the exsiccati: Barth. Fungi Columb. *2416, 3216.*

35. **Cintractia axicola.**

Add, under CYPERACEAE:

Fimbristylis autumnalis, New York, Oklahoma.
**Fimbristylis complanata*, Puerto Rico.
Fimbristylis diphylla, Costa Rica; Santo Domingo; St. Thomas.
**Fimbristylis ferruginea*, Mexico; Cuba; Santo Domingo; Jamaica; Puerto Rico; St. Kitts; St. Thomas.
**Fimbristylis puberula* (*F. spadicea*), Santo Domingo.
**Fimbristylis Vahlii*, Oklahoma.
Fimbristylis sp., Arkansas, Florida.
**?Scirpus brizoides*, Panama, Trinidad.

Add the illustration: Ark. Bot. **23A**[14]: *pl. 2, f. 5.*

Add the exsiccati: Ciferri, Myc. Doming. Exs. *3.*

35. Insert:

11a. **Cintractia minor** (Clinton) Jackson, Mycologia **12**: 153. 1920.

Cintractia axicola var. *minor* Clinton, Jour. Myc. **8**: 143. 1902.

Sori at the base of the pedicels, elongate to subspheric, 3–6 mm. in length (rarely in ovaries and then shorter), at first with a thick whitish false membrane covering the olive-black agglutinated spore-mass; sterile cells apparently subspheric but usually indistinct through gelatinization; spores reddish-brown, ovoid to subspheric or slightly angled, apparently smooth, 10–13 μ in length.

ON CYPERACEAE:
Cyperus Grayii, Delaware, Maryland, New Jersey, New York.
Cyperus ligularis, Puerto Rico.
Cyperus rotundus, Puerto Rico.
Cyperus sphacelatus, Puerto Rico.
TYPE LOCALITY: New Jersey, Sandy Hook, on *Cyperus Grayii*.
DISTRIBUTION: New York to Maryland and Puerto Rico.
EXSICCATI: Ellis & Ev. N. Am. Fungi *2423*.
NOTE: This was treated on page 35 as *Cintractia axicola* var. *minor*.

11b. **Cintractia Clintonii** Ciferri, Ann. Myc. **26**: 30. 1928.

Sori usually in the ovaries of flower-parts, ovate, about 1–2 mm. in length, covered by a whitish membrane which ruptures revealing an agglutinated black spore-mass; sterile cells usually indefinite through gelatinization of wall; spores reddish-brown, opaque, spheric to subspheric, but angled by comparison, verruculate, chiefly 11–15 μ in length.

ON CYPERACEAE:
Fimbristylis Holwayana, Mexico.
TYPE LOCALITY: Mexico, on *Fimbristylis Holwayana*.
DISTRIBUTION: Mexico.
NOTE: The type of this smut was listed on page 35 under *Cintractia axicola*. There is a note with the specimen in the Clinton herbarium stating that this is an "unusual form with verruculose spores 12.5–15 μ."

35. **Cintractia utriculicola.**

Add, under CYPERACEAE:

**Mariscus jamaicensis* (*Cladium jamaicense*), Puerto Rico.
Rynchospora corymbosa, Santo Domingo.

Add the note: Ciferri (Ark. Bot. **23A**[14]: 8. 1931) reports this smut from Santo Domingo, but his illustration (*pl. 1, f. 2*) seems to indicate that it is *Cintractia leucoderma*.

35. **Cintractia leucoderma.**

Add the synonyms: *Cintractia usambarensis* Ciferri, Ark. Bot. **23A**[14]: 7. 1931. *Cintractia amicta* Ciferri, Ark. Bot. **23A**[14]: 10. 1931. *Cintractia Portus-Argenti* Ciferri, Ark. Bot. **23A**[14]: 14. 1931.

Omit the synonym: *Cintractia affinis* Peck.

Change the description to read as follows:

Sori surrounding pedicels, peduncles, or culms, forming conspicuous oval to elongate bodies, 7–35 mm. in length, covered with a thick white membrane that on gradually

wearing away exposes the firmly agglutinated black spore-mass; sterile cells more or less gelatinized; spores medium-reddish-brown to drak-reddish-brown, chiefly ovoid to subspheric or angled somewhat by pressure, obscurely to evidently verruculose, usually 13–18 μ, or on some hosts even 15–21 μ in length.

Add, under CYPERACEAE:

**Rynchospora barbata*, Santo Domingo (*Cintractia amicta*).
**Rynchospora corymbosa*, Panama; Cuba, Santo Domingo (*Cintractia usambarensis*), Puerto Rico.
**Rynchospora cyperoides*, Santo Domingo, Puerto Rico.
Rynchospora sp., Mexico (Sydow, Ust. *224*); Santo Domingo (*Cintractia Portus-Argenti*).

Add the distribution: Mexico; Panama; West Indies.

Add the illustrations: Ark. Bot. **23A**[14]: *pl. 1, f. 1, 4.*

Omit, under CYPERACEAE:

Rynchospora corniculata, Florida.
Rynchospora corniculata macrostachya (*R. macrostachya*), New York.
Rynchospora Tracyi, Florida.

Add the exsiccati: Ciferri, Myc. Doming. Exs. *5*, *6*.

Add the note: This species is so variable in its different hosts that they run together if one attempts to separate them morphologically. If one were to base the smuts on host-species there would be 25–30 on *Rynchospora* alone, and it would then be chiefly a matter of determining the host rather than the smut.

36. Insert:

13a. **Cintractia striata** Clinton & Zundel, sp. nov.

Similar to *C. leucoderma*, with sori on culms, 15–35 mm. in length; spores more regular and less fragile, light-reddish-brown, ovoid to chiefly subspheric or spheric, moderately thick-walled, with long, semispiral striae becoming verruculose at poles (seen best under an immersion-lens), 14–18 μ in diameter. (See page 1029.)

ON CYPERACEAE:
Rynchospora Tracyi, Florida.
Type collected at Fort Pickens, Florida, by S. M. Tracy (*no. 8355*), on *Rynchospora Tracyi*.
NOTE: Close to *Cintractia affinis*, but with spores smaller, lighter-colored and with a very distinctly marked epispore. Previously referred to *C. leucoderma* (N. Am. Flora **7**: 36).

13b. **Cintractia affinis** Peck, Bull. N. Y. State Mus. **67**: 28. 1903.

Similar to *C. leucoderma*, with sori on culms 3–6 cm. in length; spores dark-reddish-brown, ovoid to chiefly subspheric or spheric, moderately thick-walled, under lower power obscurely verruculose but with an immersion-lens showing verruculations, striae or even reticulations, 16–21 μ in diameter.

ON CYPERACEAE:
Rynchospora macrostachya, New York.
TYPE LOCALITY: Smithtown, Suffolk County, Long Island, New York, on *Rynchospora macrostachya*.
DISTRIBUTION: New York.
NOTE: Distinguished by larger more regular spores and distinct marking on epispores. Previously referred to *C. leucoderma* (N. Am. Flora **7**: 36).

13c. **Cintractia pachyderma** H. Sydow, Ann. Myc. **22**: 282. 1924.

Similar to *C. leucoderma*, with sori on pedicels, relatively short and thick, 10–15 mm. in length; spores more regular, chiefly subspheric to spheric, with a thin, brittle, striate epispore and a very thick (4–6 μ) apparently gelatinous endospore, 20–27 μ in diameter.

ON CYPERACEAE:
Rynchospora corniculata, Florida.
TYPE LOCALITY: Miami, Florida, on *Rynchospora corniculata*.
DISTRIBUTION: Florida.
EXSICCATI: Seymour & Earle, Econ. Fungi *C104*.
NOTE: Differs from *C. affinis* in having larger spores with very thick endospore. Previously referred to *C. leucoderma* (N. Am. Flora **7**: 36).

36. **Schizonella melanogramma.**

Add, under CYPERACEAE:

**Carex aquatilis* (*C. stans*), Herschel Island.
**Carex communis*, Massachusetts, New Jersey, Tennessee.
**Carex convoluta*, Indiana.
Carex laxiflora, Ontario.
**Carex longirostris*, Wisconsin.
**Carex nebraskensis*, Nevada, Utah.
Carex pennsylvanica, Indiana, Minnesota, North Dakota, Pennsylvania; Ontario.
**Carex picta*, Indiana.
**Carex tetanica*, Ontario.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *pl. 45;* Arch. Nat. Land. Böhmen **15**[3]: *f. 14.*

Add the exsiccati: Sydow, Ust. *239*, *240*, *284*, *333*, *334*, *335*, *469*, *470*, *486;* Barth. Fungi Columb. *3480.*

37. **Mykosyrinx Cissi.**

Add, under VITACEAE:

Cissus acida (*Vitis acida*), Yucatan; St. Croix.
Cissus sicyoides, Cuba.
**Cissus trifoliata*, Santo Domingo; Puerto Rico.
Cissus sp., Campeche, Yucatan; British Honduras; Guatemala; St. Croix; St. Thomas.

37. **Sorosporium consanguineum.**

Add the synonym: *Sorosporium Aristidae* Neger, Anal. Univ. Chile **93**: 789. 1896.

Add, under POACEAE:

Aristida glauca, California.
Aristida longiseta, Colorado, Kansas.
Aristida Orcuttiana (*A. Schiedeana*), Arizona.
Aristida sp., New Mexico.

Add the illustrations: Rev. Myc. II. **2**: 83. *f. 5; pl. II, f. 1–10.*

38. Insert:

1a. **Sorosporium Reilianum** (Kühn) McAlpine, Smuts Austr. 181. 1910.

Sphacelotheca Reiliana (Kühn) Clinton (see page 29).

ON POACEAE:
Sorghum vulgare, Oklahoma.
Sorghum sp., Arizona.
Zea Mays, California, Idaho, Indiana, New Mexico, Oregon, Utah, Washington.
NOTE 1: For description and other data see pages 29 and 30.
NOTE 2: This species possesses the characteristic false membrane of *Sphacelotheca* and according to McAlpine the spore-balls of *Sorosporium*. Potter (Jour. Agr. Res. **2**: 340. 1914) follows McAlpine in this classification. After a careful examination of the descriptions and illustrations of both these authors, and a slide sent by the former, we are still somewhat in doubt about the matter. Examination of mature spore-bearing material rarely shows any very characteristic spore-balls, although there is often an association of spores in irregular groups likely to be found with various smuts. Since, however, we have not had a chance to examine the fungus thoroughly in its various immature stages, we accept McAlpine's classification with these expressed doubts—to be removed or confirmed by further study if opportunity permits.

38. Insert:

2a. **Sorosporium ovarium** D. Griff. Bull. Torrey Club **34**: 209. 1907.

Sori in the ovaries, at first concealed by the enveloping glumes, linear, 5–6 mm. in length, covered with a reddish-brown membrane which ruptures at the apex, revealing a dark-brown granular spore-mass; spore-balls oblong, often irregular, semi-permanent, opaque, chiefly 60–130 μ in length; spores light-reddish-brown, subspheric, often angular, minutely echinulate, chiefly 8–12 μ in diameter.

ON POACEAE:
Panicum reptans (*P. caespitosum*), Mexico.
TYPE LOCALITY: Dublan, Hildago.
DISTRIBUTION: Mexico.

2b. **Sorosporium confusum** H. S. Jackson, Bull. Torrey Club **35**: 148. 1908.

Sori in the ovaries, enclosed by the enveloping glumes, 3–4 mm. in length, elongate, covered by a delicate membrane which ruptures irregularly disclosing a dark-brown granular spore-mass; spore-balls somewhat irregular, easily separating into spores when mature, chiefly 45–100 μ in length, occasionally somewhat smaller; spores reddish-brown, subspheric or polyhedral, often flattened and then appearing elongate or subcircular in section, according to view, verruculose, chiefly 11–14 μ (rarely as small as 9.5 or as large as 15 μ) in length.

ON POACEAE:
Aristida dichotoma, California, Delaware, Ohio, Pennsylvania.
Aristida longespica (*A. gracilis*), Indiana.
?*Aristida purpurascens*, Alabama.
Aristida sp., Colorado, Texas.
TYPE LOCALITY: Newark, Delaware.
DISTRIBUTION: Delaware to Ohio and Alabama to California.
EXSICCATI: Ellis & Ev. N. Am. Fungi *1494*.
NOTE: This was previously confused with *S. Ellisii* in N. Am. Flora. It is questionable if this species is really distinct from *S. Ellisii;* it differs by its somewhat smaller spores and by the sori, which are confined to the individual spikelets, but sometimes these distinctions fail and one is in doubt where to place individual specimens.

38. **Sorosporium Everhartii.**

Add, under POACEAE:

**Andropogon brachystachyus*, Florida.
**Andropogon furcatus*, Missouri.
**Andropogon ternarius*, Florida, North Carolina.
Andropogon virginicus, Louisiana, North Carolina, Pennsylvania.
Schizachyrium scoparium (*Andropogon scoparius*), New Hampshire, New Jersey, Pennsylvania, Vermont, Virginia.

Add the exsiccati: Barth. Fungi Columb. *3082*, *4287*.

38. **Sorosporium contortum.**

Add, under POACEAE:

Heteropogon contortus (*Andropogon contortus*), New Mexico.

38. **Sorosporium Syntherismae.**

Add, under POACEAE:

**Cenchrus incertus* (*C. carolinianus*), Indiana, Pennsylvania, Wisconsin.
**Cenchrus pallidus*, Nicaragua.
**Cenchrus pauciflorus*, Indiana, Oregon.
Cenchrus tribuloides, New Jersey, North Dakota; Ontario; Bermuda.
Cenchrus sp., Arkansas; San Luis Potosí.
Panicum capillare, Colorado, Connecticut, Missouri, North Dakota, Wisconsin; Ontario.
Panicum dichotomiflorum (*P. proliferum*), Connecticut, Idaho, Indiana, Maryland, Mississippi, New Jersey, New York, Pennsylvania, Virginia, West Virginia, Wisconsin.
**Panicum stramineum*, District of Columbia (in greenhouse).
**Panicum Vaseyanum*, Zacatecas.

Add the exsiccati: Brenckle, Fungi Dak. *497*, *497a*.

39. **Sorosporium Ellisii.**

Add, under POACEAE:

**Andropogon Elliottii*, Virginia.
**Andropogon glomeratus*, Louisiana, New Jersey.
Andropogon virginicus, Arkansas, Delaware.
Andropogon sp., Maryland.
Schizachyrium scoparium (*Andropogon scoparius*), Georgia, Indiana, Mississippi, South Dakota.

Add the exsiccati: Barth. Fungi Columb. *2879*.

39. Insert:

6a. **Sorosporium Saponariae** F. Rudolphi, Linnaea **4**: 116. 1829.

Ustilago Rudolphi Tul. Ann. Sci. Nat. III. **7**: 99. 1847.
Microbotryum Rudolphi Lév. Dict. Univ. Hist. Nat. **12**: 787. 1849.
Thecaphora Tunicae Auersw. Oesterr. Bot. Zeits. **18**: 242. 1868.
Caeoma Schlechtendalii Klotzsch, Herb. Viv. Myc. *87*. 1832.
Schizoderma Saponariae Fries, Syst. Myc. **3**: 477. 1832.
Sorosporium dianthorum Ciferri, Ann. Myc. **26**: 24. 1928.
Sorosporium Gypsophilae Ciferri, Ann. Myc. **26**: 25. 1928.
Sorosporium Silenis-inflatae Ciferri, Ann. Myc. **26**: 26. 1928.
Sorosporium Alsinearum Ciferri, Ann. Myc. **26**: 27. 1928.

Sori prominent in the flowers, forming a light-brown, dusty, granular spore-mass enclosed by the floral envelopes; spore-balls quite temporary, composed of numerous spores, ovoid to subspheric, about 40–100 μ in length; spores light-golden-brown, ovoid, ovate (or occasionally even oblong) to subspheric, frequently somewhat irregular or flattened by pressure, with verruculate or slightly reticulately wrinkled epispore, often smoother on the sides of spores in contact, chiefly 12–19 μ in length.

ON CARYOPHYLLACEAE:
Alsine Curtisii (*Stellaria Curtisii*), Utah.
Alsine Jamesiana (*Stellaria Jamesiana*), Colorado, Utah.
Cerastium arvense, New York.
Cerastium occidentale, Colorado.
Cerastium oreophilum, Colorado.
Silene Menziesii, Utah.
Silene Watsoni, Nevada.
TYPE LOCALITY: Germany, on *Saponaria officinalis*.
DISTRIBUTION: New York to Nevada; also in Europe and western Asia.
ILLUSTRATIONS: Beitr. Krypt. Schweiz **3**[2]: *f. 79;* Arch. Nat. Land. Böhmen **15**[3]: *f. 15*.

39. **Sorosporium provinciale.**

Add, under POACEAE:

Andropogon furcatus, Iowa.
**Andropogon* sp., Texas.

39. **Sorosporium granulosum.**

Add, under POACEAE:

Stipa comata, Colorado.
**Stipa* sp., Oregon.

Add the note: While the two preceding species are both developed in the culms, aborting the inflorescence, and have larger and darker spore-balls than *Urocystis granulosa*, in the spikelet they often show collapsed slender cells of the *Urocystis* type and so these species may run into one another.

40. **Thecaphora pilulaeformis.**

Add, under CARDUACEAE:

**Isocoma coronopifolia* (*Bigelovia coronopifolia*), Arizona.

41. Insert:

1a. **Thecaphora pustulata** Clinton; Chardon, Rev. Agr. P. Rico **6**[4]: 23. 1921.

Sori on stems, usually at nodes, forming conspicuous oblong to subspheric swellings often 10–20 mm. in length, with numerous more or less distinct blisters breaking out on these and eventually disclosing the dusty umber spore-masses; spore-balls when young with an evident hyaline envelope or indistinct mycelial threads, which by gelatinization disappear with maturity, chiefly subspheric, with 2–8 (usually 3–6) spores more or less firmly bound together, 24–45 μ in diameter; spores yellowish to reddish-brown, ovoid to subspheric but flattened on sides where in contact, prominently and abundantly verruculose on rounded free surface, chiefly 18–25 μ in length.

ON COMPOSITAE:
Bidens leucantha, Puerto Rico.
TYPE LOCALITY: Mayaguez, Puerto Rico, on *Bidens leucantha*.
DISTRIBUTION: Puerto Rico.
NOTE: The spore-balls contain about the same number of spores as those of *Thecaphora pilulaeformis* and *T. Trailii*, but the spores and consequently the spore-balls are considerably larger and the sori macroscopically resemble more those of *T. mexicana*.

41. **Thecaphora Trailii.**

Add, under CARDUACEAE:

**Cirsium Centaureae* (*Carduus Centaureae*), Colorado.

Add the exsiccati: Barth. Fungi Columb. *2383*.

41. **Thecaphora californica.**

Add, under CARDUACEAE:

**Grindelia inornata*, Colorado.
**Grindelia squarrosa*, Colorado.

Add the note: In some specimens the sori develop as fusiform swellings on the stem.

41. **Thecaphora cuneata.**

Add, under CARDUACEAE:

Grindelia squarrosa, Colorado, New Mexico, Utah; Manitoba.

Add the exsiccati: Barth. Fungi Columb. *3287*.

41. **Thecaphora deformans.**

Add, under FABACEAE:

**Astragalus Chamaeleuce*, Colorado.
**Astragalus mollissimus*, Colorado.
**Astragalus Mortoni*, California.
**Astragalus Thompsonae*, Utah.
**Astragalus Wootoni*, New Mexico.
**Lathyrus utahensis*, Utah.
**Vicia oregona*, Utah.
**Vicia trifida*, Utah.
**Vicia* sp., Ontario.

Add the exsiccati: Sydow, Ust. *368*.

Add the note: Bubák in Houby České **2**: 38 (1912) transfers the forms on *Vicia* sp. to *Thecaphora Viciae* Bubák without giving a description; further study may show that this is distinct.

42. Insert:

7a. **Thecaphora Haumani** Speg. Revista Argent. Bot. **1**: 150. 1925.

Sori in the inflorescence and stems, pustular, more or less agglutinated and covered by the greenish plant-tissues; pustules about 2–3 mm. but often merging into lobular masses 15 mm. in length; spore-balls reddish-brown, composed of 3–15 rather firmly adhering spores, 18–45 μ in length; spores yellowish-brown, irregularly ovate to subspheric, the sides more or less flattened under pressure, the free surface papillately roughened, chiefly 13–20 μ in length.

ON AMARANTHACEAE:
Iresine Celosia, Guatemala.
TYPE LOCALITY: Campana, Buenos Aires, Argentina, on *Iresine paniculata*.
DISTRIBUTION: Guatemala; also in Argentina.
NOTE: Closely related to *T. Iresine*, but differing in considerably smaller spore-balls and somewhat smaller spores and pustules on stems. We have not seen the Spegazzini specimen, but we agree with Mains in placing the Guatemala specimen here.

7b. **Thecaphora Iresine** (Elliott) H. S. Jackson, Mycologia **12**: 154. 1920.

Tolyposporium Iresine Elliott, Mycologia **11**: 88. 1919.

Sori in the ovaries of the inflorescence, as irregular lobed mass-outbreaks consisting of certain of the individual blossoms more or less compacted together, the individual lobes 1–3 mm. in diameter while semi-merged lobular masses may attain 1 cm. in length, covered by greenish plant-tissues, rupturing irregularly, and shedding a granular purplish-red spore-mass; spore-balls firm, reddish-brown, composed of 10 to many spores, ovoid to subspheric, 35–90 μ, chiefly 45–60 μ in length; spores light-reddish-yellow, or the inner spores yellowish, irregularly ovate to subspheric, the sides often flattened through pressure, the wall on free sides thickened and inconspicuously papillate, chiefly 15–20 μ, most elongate rarely 27 μ in length.

ON AMARANTHACEAE:
Iresine Celosia (*I. paniculata*), Indiana.
TYPE LOCALITY: Near Half Moon Pond, ten miles south of Mount Vernon, Posey County, Indiana, on *Iresine paniculata*.
DISTRIBUTION: Indiana.
ILLUSTRATIONS: Mycologia **11**: 87. *f. 1–4*.
NOTE: Very near *Thecaphora Thornberi*, also on *Amaranthaceae*, but differing from that species by the smaller spore-balls (chiefly 45–60 μ as compared with chiefly 75–120 μ) and consequently fewer spores, which seem to be less frequently elongate. The papillae at the free ends of the spores are rather inconspicuous in both species.

43. Insert:

DOUBTFUL AND EXCLUDED SPECIES

Thecaphora Cornuana Fisch. de Waldh. Aperçu Syst. Ust. 35. 1877. Sori in the ovaries; spore-balls globose to obtusely ovoid, 50–90 μ in length, composed of many spores (up to 50 and more); spores olivaceous-brown, angular, 8–14 μ in diameter. ON CYPERACEAE: *Scirpus affinis*, Guadeloupe. No specimen of this West Indian smut was available for examination and it is not known where the type is deposited; it is therefore excluded until a specimen is located and examined.

Thecaphora Ruppiae Setch. Mycologia **16**: 243. 1924. On *Ruppia maritima* var. *rostrata*, California. Later researches show that this fungus is *Tetramyxa parasitica* Göbel.

43. Insert:

1a. **Tolyposporella Sporoboli** H. S. Jackson; Whetzel & Kern, Mycologia **18**: 122. 1926.

Sori in sheaths and blades (apparently upper surface) of the leaves, forming usually elongate striae of varying length that on rupture show as black granular outbreaks; spores not formed in definite spore-balls but more or less agglutinated, dark-reddish-brown, with the thin outer wall often running into a point and the swollen inner wall 2–4 μ thick, ovoid to subspheric or somewhat flattened through pressure, 9–15 μ or, rarely more elongate, even 18 μ in length.

ON POACEAE:
Sporobolus indicus, Puerto Rico.
TYPE LOCALITY: El Yunque, Puerto Rico, on *Sporobolus indicus*.
DISTRIBUTION: Puerto Rico.
NOTE: The Ciferri specimen from Santo Domingo (Myc. Dom. Exs. *96*) named as this on *Sporobolus argutus* does not agree with this Puerto Rican specimen, but is apparently *Entyloma speciosum*.

43. **Tolyposporella Brunkii.**

Add, under POACEAE:

**Andropogon bicornis*, Santo Domingo; Puerto Rico.

Add the note: Ciferri reported this smut from Santo Domingo but gives the spore-measurements as 7–12 μ, while they are commonly 11–18 μ in length; the Ciferri specimen was not available for examination.

44. **Tolyposporella Nolinae.**

Add, under DRACAENACEAE:

Nolina microcarpa, New Mexico.
**Nolina texana*, Texas.

44. Tolyposporium bullatum.

Add, under POACEAE:

Echinochloa Crus-galli (*Panicum Crus-galli*), Indiana, Pennsylvania, South Dakota.
**Echinochloa frumentacea*, Connecticut.
**Echinochloa Walteri*, Indiana, New York.

44. Insert:

1a. **Tolyposporium Junci** (Schroet.) Woronin, Abh. Senck. Nat. Ges. **12**: 577. "1881" [Ja 1882].

Sorosporium Junci Schroet. Abh. Schles. Ges. Vat. Med. **1869–1872**: 6. 1871.

Sori in the inflorescence involving part of spikelets, often confined to base and contents of ovary or spreading to adjacent bracts and rachis, forming a black, granular, agglutinated mass; spore-balls forming irregular, opaque masses of several to many spores, 18–50 μ in length; spores not easily separated, variable, more or less angular, reddish-black, external wall or where not in contact thicker, chiefly 9–15 μ in length, rarely longer.

ON JUNCACEAE:
Juncus bufonius, Oregon.
TYPE LOCALITY: Germany, on *Juncus bufonius*.
DISTRIBUTION: Oregon; also in Europe.
ILLUSTRATIONS: Bref. Unters. Gesammt. Myk. **12**: *pl. 9, f. 13–24;* E. & P. Nat. Pfl. 1^{1**}: 13. *f. 8H;* McAlpine, Smuts Austr. *pl. 47, f. 159, 160;* Lind, Dan. Fungi Rostr. *f. 18;* Sorauer, Handb. Pflanzenkr. ed. 3. **2**: 329. *f.* 46^{19}; Beitr. Krypt. Schweiz **3**^{2}: *f. 46;* Arch. Nat. Land. Böhmen **15**^{3}: *f. 16.*

45. Testicularia Cyperi.

Add, under CYPERACEAE:

**Rynchospora corniculata*, Florida, Louisiana, Texas

Family 2. TILLETIACEAE

48. Tilletia foetens.

Add, under POACEAE:

**Secale cereale*, Kansas.
Triticum aestivum (*T. vulgare*), Arizona, Arkansas, California, Connecticut, Delaware, Georgia, Idaho, Maine, Mississippi, Missouri, Nevada, New Mexico, New York, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Virginia, Washington; Alberta, New Brunswick, Saskatchewan.
**Triticum dicoccum*, Missouri.
**Triticum durum*, North Dakota; Manitoba, Saskatchewan.

Add the exsiccati: Barth. Fungi Columb. *4785;* Brenckle, Fungi Dak. *132.*

48. Tilletia Tritici.

Add the synonym: *Tilletia Secalis* (Corda) Wint. in Rab. Krypt.-Fl. **1**^{1}: 110. 1881 (also Bot. Zeit. **34**: 471. 1876).

Add, under POACEAE:

**Secale cereale*, New York, Washington.
Triticum aestivum (*T. vulgare*), Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Indiana, Maryland, Massachusetts, Mississippi, Missouri, Nebraska, New Mexico, North Carolina, North Dakota, South Dakota, Tennessee, Texas, Virginia; Alberta, Manitoba, New Brunswick, Prince Edward Island, Quebec, Saskatchewan.
**Triticum dicoccum*, North Dakota; Alberta.
**Triticum durum*, North Dakota; Manitoba, Saskatchewan.
**Triticum Spelta*, Idaho, Indiana, North Dakota, Utah; Ontario.

Add the illustrations: Beitr. Krypt. Schweiz **3**^{2}: *f. 47;* Arch. Nat. Land. Böhmen **15**^{3}: *f. 18.*

Add: EXSICCATI: Brenckle, Fungi Dak. *132a.*

48. **Tilletia Elymi.**

Add, under POACEAE:

Elymus glaucus, Colorado, Wyoming.

Change the distribution: Rocky Mountains and Pacific northwest.

48. **Tilletia Anthoxanthi.**

Add, under POACEAE:

Anthoxanthum odoratum, Pennsylvania; Nova Scotia.

49. Insert:

4a. **Tilletia Guyotiana** Hariot, Jour. de Bot. **14**: 117. 1900.

Thecaphora Guyotiana Hariot, Mém. Soc. Acad. Aube **61**: 195; hyponym. 1898.
Tilletia Velenovskyi Bubák, Oesterr. Bot. Zeits. **53**: 51. 1903.
Tilletia belgradensis Magnus, Hedwigia **48**: 145. 1908.

Sori in ovaries, oblong to oval, pointed, with styles and delicate ovary-walls usually intact, 3–4 mm. in length, chiefly hidden by the enveloping glumes, infecting all of the spikelets; sterile hyaline cells occasional, subspheric, with moderately thick and smooth walls, considerably smaller than the spores; spores usually golden-yellow (in European specimens sometimes mixed with others having a purplish tint), subspheric to spheric or occasionally more elongate, with prominent regular reticulations about 2–4 μ in diameter and extending 1–2 μ beyond the margin, 20–26 μ in length, or more elongate rarely 30 μ.

ON POACEAE:
Bromus mollis (*B. hordeaceus*), Idaho, Washington.
Bromus racemosus (*B. hordeaceus* var. *glabrescens*), Idaho, Washington.
Bromus sp., California.
TYPE LOCALITY: Gye-sur-Seine, Aube, France, on *Bromus erectus*.
DISTRIBUTION: Western United States; also in Europe and Asia.
ILLUSTRATION: Hedwigia **48**: 146. *f. 1–7*.

49. **Tilletia Muhlenbergiae.**

Add, under POACEAE:

**Muhlenbergia* sp., Aguas Calientes.

49. **Tilletia cerebrina.**

Becomes a synonym of **Tilletia Airae.**

49. **Tilletia Airae.**

Add the synonym: *Tilletia cerebrina* Ellis & Ev. Jour. Myc. **3**: 56. 1887.

Add, under POACEAE:

Deschampsia caespitosa, Rocky Mountains.
Deschampsia elongata, Idaho.

49. **Tilletia fusca.**

Add, under POACEAE:

**Festuca pacifica*, Washington.

50. Insert:

9a. **Tilletia Holci** (Westend.) De-Toni, in Sacc. Syll. Fung. **7**[2]: 484. 1888.

Polycystis Holci Westend. Bull. Acad. Belg. II. **11**: 651. 1861.
Tilletia Rauwenhoffii Fisch. de Waldh. Aperçu Syst. Ust. 50. 1877.

Sori in the ovaries, apparently all of the spikelets infected, more or less hidden by the enveloping glumes, forming an oblong or ovoid body about 2 mm. in length, with the styles still attached and the fragile thin ovary-coats concealing the dusty brown-black spore-mass; sterile cells few, hyaline, moderately thin-walled, ovoid to subspheric, smooth,

smaller than the spores; spores light-reddish-brown, chiefly subspheric or spheric, with evident rather uniform polygonal reticulations (3–6 μ in length) of the outer coat extending at the circumference as conspicuous hyaline spiny-ribbed wings (2–4 μ), chiefly 24–30 μ in length (including wings).

ON POACEAE:
Holcus lanatus, Massachusetts, Oregon, Pennsylvania, Washington.
TYPE LOCALITY: Belgium, on *Holcus lanatus*.
DISTRIBUTION: Pacific Northwest, Massachusetts, and Pennsylvania; also in Europe and New Zealand.
ILLUSTRATIONS: Bull. Acad. Belg. II. **11**: *f. 1;* Kew Bull. 1899: *pl. 4, f. 4, 5;* McAlpine, Smuts Austr. *pl. 49, f. 178, 179.*
EXSICCATI: Sydow, Ust. *372.*

50. **Tilletia asperifolia.**

Add, under POACEAE:

**Muhlenbergia arenacea* (*Sporobolus auriculatus*), New Mexico.
Muhlenbergia asperifolia (*Sporobolus asperifolius*), California.
**Sporobolus microspermus* (*S. confusus*), Colorado.

50. Insert:

11a. **Tilletia decipiens** Körn. Hedwigia **16**: 30. 1877.

Uredo segetum var. *decipiens* Pers. Syn. Fung. 225. 1801.
Uredo decipiens var. *graminum* Strauss, Ann. Wett. Ges. **2**: 111. 1810.
Erysibe sphaerococca var. *Agrostidis* Wallr. Fl. Crypt. Germ. **2**: 213. 1833.
Uredo (*Ustilago*) *sphaerococca* Rab. Deutschl. Krypt.-Fl. **1**: 4. 1844.
Tilletia caries var. *Agrostidis* Auersw.; Rab. Fungi Eur. *700.* 1864.
Tilletia sphaerococca Fisch. de Waldh. Bull. Soc. Nat. Mosc. **40**[1]: 255. 1867.

Sori in the ovaries, involving most of the inflorescence, somewhat concealed by the enveloping glumes, elliptic to ovate, about 1 mm. in length; spores light-brown or golden-brown to reddish-brown, chiefly subspheric or spheric, with numerous reticulations, sometimes indistinct at center of spores but always evident at margins as wings extending out about 2–3 μ, chiefly 22–27 μ, or irregular and the largest even 30 μ in diameter.

ON POACEAE:
Agrostis perennans var. *elata* (*A. elata*), Tennessee.
TYPE LOCALITY: Europe, on *Agrostis vulgaris* (*A. pumila*).
DISTRIBUTION: Tennessee; also in Europe, Azores, and New Zealand.
ILLUSTRATIONS: Beitr. Krypt. Schweiz **3**[2]: *f. 49;* Arch. Nat. Land. Böhmen **15**[3]: *f. 19.*
NOTE: Our single specimen was collected by S. M. Bain, October 10, 1892, at Jackson, Tennessee, and was sent to us by Professor Hesler. It is on a new host and does not agree exactly with the European specimens, but this may be due to immaturity. The spores often appear coarsely spiny or tuberculate, rather than reticulate, but the wings can usually be seen at the circumference. The type on *Agrostis vulgaris* causes a stunting of the plants, which are then sometimes known as *A. pumila;* also found on *A. stolonifera.*

50. **Tilletia Earlei.**

Add the synonym: *Ustilago Earlei* Ciferri, Trans. Brit. Myc. Soc. **18**: 263. 1934.

Add, under POACEAE:

**Agropyron repens*, North Dakota.

Add the note: Only actual germination of spores will definitely determine the systematic position of a smut. The formation of the sori on the leaves is not enough to change a species from *Tilletia* to *Ustilago;* the spores in this species are typical for *Tilletia.*

51. **Tilletia texana.**

Add, under POACEAE:

**Hordeum pusillum*, Missouri, Oklahoma.

Add: EXSICCATI: Rab.-Paz. Fungi Eur. *4404.*

51. Insert:

15a. **Tilletia Youngii** Clinton & Zundel, sp. nov.

Sori in the ovaries of the inflorescence occupying most of the spikelets, especially the upper, hidden almost completely by the enveloping glumes, covered by a thin plant-

membrane, elliptic but tapering into a style-like apex, about 2 mm. in length (including the tapering apex), also in the internodes forming more or less elongate swellings from the base upward, stunting the plants, and colored purplish-red; sterile cells subspheric to spheric (often with a papilla at one end), medium to thin-walled, hyaline, 10–15 μ in diameter; spores subspheric to spheric, hyaline to light-golden-yellow but often golden-brown with age, with prominent spiny tubercles becoming less conspicuous and blunt with maturity, and projecting 2–3 μ to hyaline envelope, chiefly 23–27 μ in diameter, sometimes even 30 μ. (See page 1029.)

ON POACEAE:
Alopecurus carolinianus (*A. ramosus*), Arkansas.
Type collected at Mariana, Arkansas, on *Alopecurus ramosus*, by V. H. Young, April, 1926.
DISTRIBUTION: Arkansas.
NOTE: This seems to come nearest to *T. texana* and *T. Wilcoxiana*. It is curious that both culms and ovaries are infected.

51. **Tilletia buchloeana.**

Change description of spores to read: "spores obscurely reticulate to coarsely tuberculate."

Add, under POACEAE:
Buchloë dactyloides (*Bulbilis dactyloides*), Nebraska.

52. **Tilletia corona.**

Add, under POACEAE:
Leersia lenticularis, Wisconsin.
Leersia oryzoides, Wisconsin.
Leersia virginica, Iowa, Maryland, Wisconsin.

52. **Tilletia pulcherrima.**

Add, under POACEAE:
**Panicum capillare*, Pennsylvania.
Panicum virgatum, Iowa, Kansas.

52. **Tilletia horrida.**

Add, under POACEAE:
Oryza sativa, Arkansas, Louisiana.

53. Insert the doubtful species:

Tilletia chloridicola Ciferri, Ann. Myc. **26**: 10. 1928. ON POACEAE: *Chloris paraguayensis* (*C. barbata*), Santo Domingo. TYPE LOCALITY: Haina, Santo Domingo, on *Chloris paraguayensis*. DISTRIBUTION: Santo Domingo. NOTE: We have seen no specimen of this species; its spores are given as 12.5–15 μ or occasionally 18 μ, which seem rather small for a *Tilletia*. A Latin description accompanies Ciferri's paper, to which the reader is referred. It is the only *Tilletia* reported on *Chloris*, though six other smuts have been described on this host-genus.

54. **Tuburcinia Clintoniae.**

Add, under CONVALLARIACEAE:
Streptopus roseus, Wisconsin.

54. **Tuburcinia Trientalis.**

Add, under PRIMULACEAE:
**Trientalis latifolia*, Oregon, Washington.

55. **Urocystis Waldsteiniae.**

Add the synonym: *Tuburcinia Waldsteiniae* Liro, Ann. Univ. Fenn. Aboen. A. 1^1: 91. 1922.

Add, under ROSACEAE:
Waldsteinia fragarioides, Quebec, Saskatchewan.

Add the note: The systematic position of this species is still doubtful. Recently it has been proved not to be a typical *Urocystis*, since it germinates like a *Ustilago* but has fragments of sterile cells.

55. **Urocystis Anemones.**

Add the synonym: *Tuburcinia Anemones* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 55. 1922.

Add, under RANUNCULACEAE:

Anemone quinquefolia, Delaware; Ontario.
Anemone virginiana, Indiana.
Hepatica acuta (*H. acutiloba*), Maine, Pennsylvania.
Hepatica americana, New York, Virginia.
Hepatica sp., Ohio.
Pulsatilla ludoviciana (*P. hirsutissima*, *Anemone patens* var. *Nuttalliana*, *A. patens* var. *Wolfgangiana*), North Dakota, South Dakota; Alberta, Manitoba, Saskatchewan.
**Ranunculus septentrionalis*, Missouri.
Ranunculus sp., British Columbia.
Syndesmon thalictroides (*Anemonella thalictroides*), Iowa.
**Trautvetteria grandis*, Utah.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 72.*

Add the exsiccati: Sydow, Ust. *473;* Brenckle, Fungi Dak. *18.*

Add the note: The spores on *Syndesmon thalictroides* are a little too long for this species; they measure about half as much as those of *U. sorosporioides.* On page 55, *Syndesmon thalictroides* was listed from New York as a host of this smut; this host has since been determined as *Thalictrum* sp. and the smut as *Urocystis sorosporioides* (see below).

55. **Urocystis carcinodes.**

Add the synonym: *Tuburcinia carcinodes* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 80. 1922.

Add, under RANUNCULACEAE:

**Aconitum columbianum*, Utah.
Actaea alba, Pennsylvania.
**Actaea viridiflora* (*A. rubra*), Idaho, Utah.
Cimicifuga racemosa, New York, Virginia.

56. **Urocystis sorosporioides.**

Add the synonym: *Tuburcinia sorosporioides* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 77. 1922.

Add, under RANUNCULACEAE:

**Anemone narcissiflora*, Alaska.
**Aquilegia caerulea*, Utah.
**Beckwithia Andersonii*, Nevada.
**Delphinium decorum*, California.
**Delphinium tricorne*, Kentucky.
Thalictrum sp., New York (erroneously reported on page 55 as *Urocystis Anemones* on *Syndesmon thalictroides*).

Add: ILLUSTRATION: Beitr. Krypt. Schweiz **3**[2]: *f. 73.*

Add: EXSICCATI: Barth. Fungi Columb. *3493;* Sydow, Ust. *375.*

56. **Urocystis Violae.**

Add the synonym: *Tuburcinia Violae* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 91. 1922.

Add, under VIOLACEAE:

**Viola glabella*, Alaska.
**Viola longipes*, Utah.
**Viola Nuttallii*, California.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 74;* Arch. Nat. Land. Böhmen **15**[3]: *f. 23.*

56. Insert:

5a. **Urocystis Kmetiana** Magnus, Verh. Bot. Ver. Brand. **31**: xix. 1890.

Tuburcinia Kmetiana Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 94. 1922.

Sori confined to the ovaries, forming rounded masses 3–5 mm. in diameter, on rupture disclosing a granular black spore-mass; spore-balls reddish-brown, irregularly oblong to

chiefly subspheric, 20–60 μ, usually 30–40 μ in length; sterile cells rather completely covering the spore-balls, semihyaline to yellow-brown, usually collapsing or cupping with age, chiefly 8–12 μ in length; spores reddish-brown, often flattened when in contact with other spores, irregularly ovoid to subspheric, 2–10, chiefly 4–8, in a ball, 11–16 μ in length.

ON VIOLACEAE:
Viola Rafinesquii, Arkansas, Missouri, Tennessee.
TYPE LOCALITY: Hungary, on *Viola tricolor* var. *arvensis*.
DISTRIBUTION: Arkansas, Missouri, Tennessee; also in Europe.
NOTE: Magnus states that this species has spores and spore-balls similar to those of *Urocystis Violae*, differing in being confined entirely to the ovaries, while the latter occurs on the stems and leaves. We find this true of the American specimen, whose host at one time was also considered identical with the European. It is doubtful whether the two smuts are distinct. Our specimens agree with those of Rab.-Paz. Fungi Eur. *4107*, and Vesterg. Micr. Rar. Sel. *332*. Rosen states this smut is not uncommon in the region of Fayetteville, Arkansas.

56. **Urocystis Lithophragmae.**

Add the synonyms: *Tuburcinia Lithophragmae* Liro, Ann. Univ. Fenn. Aboen. A. 1[1]: 87. 1922. ?*Urocystis Heucherae* Garrett, Mycologia **25**: 151. 1933.

Add, under SAXIFRAGACEAE:

Heuchera parvifolia, Utah.

57. **Urocystis Cepulae.**

Add the synonym: *Tuburcinia Cepulae* Liro, Ann. Univ. Fenn. Aboen. A. 1[1]: 47. 1922.

Add, under ALLIACEAE:

Allium Cepa, Alabama, California, Colorado, Illinois, Iowa, Kentucky, Maine, Maryland, Minnesota, North Dakota, Oregon, Pennsylvania, South Dakota; Alberta, Manitoba, Ontario, Quebec; Puerto Rico.

57. Insert:

7a. **Urocystis magica** Pass.; Thüm. Myc. Univ. *223*. 1875.

Tuburcinia magica Liro, Ann. Univ. Fenn. Aboen. A. 1[1]: 49. 1922.

Sori in leaves, slightly elevated, isolated or confluent, large, elongate, at first lead-colored and covered by the epidermis, upon rupture exposing a brownish-black spore-mass; spore-balls dark-reddish-brown, ovoid to spheric, 19–35 μ in length; sterile cells light-brown, thick-walled, rather closely covering the spores, 5.5–9.5 μ in length; spores reddish-brown, ovoid to subspheric, often somewhat irregular in shape, usually solitary, rarely 2 in a ball, chiefly 15–19 μ in length.

ON ALLIACEAE:
Allium Palmeri, Utah.
TYPE LOCALITY: Parma, Italy, on *Allium magicum*.
DISTRIBUTION: Utah; also in Italy.
ILLUSTRATIONS: Ann. Rep. Conn. Exp. Sta. 1889: *pl. 2, f. 5, 6*.
EXSICCATI: Thüm. Myc. Univ. *223;* Rab. Fungi Eur. *2100*.
NOTE: This is the first report of this smut in North America, although it was collected by Dr. E. Palmer (*453*) at Beaver City, Utah, in 1877, and sent to us by J. C. Arthur. It seems to agree much more nearly with *U. magica* than it does with *U. Cepulae*. The spore-balls are chiefly 19–35 μ in length, and rather closely covered with reddish-brown, rather thick-walled sterile cells, 5.5–9.5 μ in length, with generally one, rarely two fertile cells (reddish-brown), these chiefly subspheric to oval but often somewhat irregular and 15–19 μ in length. It differs from *U. Cepulae* chiefly in the larger size of the spore-balls and sterile (?) parts.

7b. **Urocystis Erythronii** Clinton, sp. nov.

Sori in the leaves, elliptic, small, 1–2 mm. in length but usually merging lengthwise into linear striae and often sidewise into irregular areas and so often losing their individuality, showing on both surfaces as lead-colored slightly raised granular blisters that are covered rather permanently by the epidermis; spore-balls ovoid to subspheric, very dark-reddish-brown or blackish-brown, opaque or subopaque, with tinted cortex of indefinite collapsed sterile cells completely, thickly, and permanently investing the 1–3, rarely 4 or 5 spores, chiefly 25–45 μ in length; spores dark-reddish-brown, usually subspheric when single but often more elongate and flattened when with two or more in a ball, 15–18 μ, rarely 21 μ. (See page 1029.)

ON LILIACEAE:
Erythronium americanum, Connecticut, New York.
Type collected on *Erythronium americanum*, by G. P. Clinton, at Centerville, Connecticut, April–May, 1908.
DISTRIBUTION: Connecticut and New York.
NOTE: This species is quite distinct from *Urocystis Colchici* on *Colchicum* and even from the darker-spored form on *Muscari* and *Camassia* by the very dark spore-balls with the indefinite collapsed sterile cells completely and permanently covering the spores. It is almost impossible to measure the spores on this account and the real nature of the sterile cells is only surely made out by boiling the infected tissue in a weak solution of caustic soda. We know of no other species of *Urocystis* with such permanent spore-balls and with so completely collapsed and tightly adhering cortex that resembles more an outer ridged coat than distinct cells. To a certain extent the species approaches the genus *Tuburcinia*. The type was associated with *Ustilago Heufleri*.

57. **Urocystis Colchici.**

Add the synonym: *Tuburcinia Colchici* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 52. 1922.
Add, under CONVALLARIACEAE:

**Camassia Quamash* (*C. esculenta*), Oregon.
**Camassia scilloides* (*C. Fraseri*), Indiana.
**Colchicum autumnale*, New York; Ontario.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 169*.

57. Insert:

8a. **Urocystis Trillii** H. S. Jackson, Mycologia **12**: 151. 1920.

Sori in the stems, petioles, and leaf-blades, scattered or clustered, forming subcircular to chiefly elliptic pustules 3–10 mm. in length (or by merging longer), covered at first by the epidermis but soon rupturing and disclosing the purple-black, dusty spore-mass mixed with white strands of plant-tissue; spore-balls firm, ovoid to subspheric, dark-reddish-brown, consisting chiefly of 2–12 spores surrounded by a moderately tinted and thin-walled cortex of often collapsed sterile cells (about 8–14 μ), 25–70 μ in length; spores reddish-brown, ovoid to subspheric, flattened where in contact, with thick apparently smooth walls, 12–18 μ in length or rarely longer.

ON TRILLIACEAE:
Trillium chloropetalum, Oregon.
Trillium grandiflorum, Quebec.
Trillium ovatum, Idaho.
TYPE LOCALITY: Corvallis, Benton County, Oregon, on *Trillium chloropetalum*.
DISTRIBUTION: Oregon, Idaho.

8b. **Urocystis Flowersii** Garrett, Mycologia **18**: 286. 1926.

Sori on leaves, slightly pustular, elliptic, lead-colored before opening by a central crack and then blackish with an agglutinated spore-mass, 1–2 mm., or by coalescence even 5 mm. or more in length; spore-balls more or less irregular, oblong to subspheric, dark-brown, 25–80 μ in length; sterile cells yellowish-brown, ovoid to elliptic, rather completely covering the spores and somewhat smaller; spores reddish-brown, irregular, ovoid to subspheric, chiefly 5–12 in a ball, apparently rather firmly held together, 10–18 μ in length.

ON MELANTHACEAE:
Anticlea elegans (*Zygadenus elegans*), Utah.
TYPE LOCALITY: Glacier Cirque, Mt. Timpanogos, above Aspen Grove, Utah County, Utah, on *Zygadenus elegans*.
DISTRIBUTION: Utah.
NOTE: The spore-balls are somewhat immature and are so tightly bound together that the size and shape of the spores are not easily determined in the type specimen.

8c. **Urocystis Gladioli** (Requien) W. G. Smith, Gard. Chron. II. **6**: 421. 1876.

Uredo Gladioli Requien; Duby, Bot. Gall. 901. 1830.
Erysibe arillata var. *Gladioli* Wallr. Fl. Crypt. Germ. **3**: 211. 1833.
Tuburcinia Gladioli Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 37. 1922.

Sori on the corms and leaves, pustular, small, dark-colored, at first covered by the epidermis; spore-balls dark-reddish-brown, ovoid to spheric, chiefly 45–50 μ in diameter, rarely 65 μ or as small as 24 μ; sterile cells completely covering the spores, brownish-

yellow, thick-walled, ovoid, sometimes difficult to distinguish from the spores, chiefly 6–10 μ in diameter; spores dark-reddish-brown, ovoid to spheric, often flattened on one side, smooth, chiefly 4–9 in a ball, chiefly 14–17 μ in length.

ON IRIDACEAE:
Gladiolus sp. (cult.), Pennsylvania (Erie Co.); Saskatchewan.
TYPE LOCALITY: France, on *Gladiolus communis*.
DISTRIBUTION: Pennsylvania; also in Europe and Japan.
ILLUSTRATIONS: Gard. Chron. II. **6**: *f. 84, f. 85 a, b.*

57. **Urocystis occulta.**

Add the synonym: *Tuburcinia occulta* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 12. 1922.

Add, under POACEAE:

Secale cereale, Idaho, Illinois, Indiana, Iowa, Michigan, Missouri, North Dakota, Pennsylvania, South Dakota, Tennessee, Wisconsin; Alberta, Manitoba, Ontario; Saskatchewan.

Add the illustrations: Beitr. Krypt. Schweiz **3**[2]: *f. 66;* Arch. Nat. Land. Böhmen **15**[2]: *f. 22.*

Add the exsiccati: Brenckle, Fungi Dak. *673.*

57. Insert:

9a. **Urocystis Tritici** Körn. Hedwigia **16**: 33. 1877.

Tuburcinia Tritici Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 17. 1922.

Sori chiefly in the leaves (occasionally in the stem and rarely in the glumes), forming elongate striae, more or less merged and often involving most of the parenchyma, at first covered by epidermis and lead-colored but eventually rupturing and shedding the granular black spore-mass; spore-balls dark-reddish-brown, irregularly subspheric to oblong, composed of 1–3, rarely 4 or 5 spores, covered rather completely by a cortex of deeply tinted sterile cells (subspheric to oval, 6–12 μ long as applied to spores), chiefly 20–40 μ in length; spores dark-reddish-brown, irregularly ovoid to subspheric, apparently smooth, chiefly 12–18 μ, rarely 20 μ in length.

ON POACEAE:
Triticum aestivum (*T. vulgare*), Illinois, Kansas, Missouri.
TYPE LOCALITY: South Australia, on *Triticum vulgare*.
DISTRIBUTION: Illinois, Kansas, Missouri; also in Australia, Europe, and Asia.
ILLUSTRATIONS: McAlpine, Smuts Austr. *pl. 4, 5c, 6a, 7, 51.*
NOTE: This species is very close to *Urocystis occulta* and by some authors regarded as identical with it; the slight differences seem to be the more complete envelopment of the spores by the slender cells and the apparently somewhat large spores and spore-balls.

58. **Urocystis Agropyri.**

Add the synonyms: ? *Urocystis Bornmülleri* Magnus, Ber. Deuts. Bot. Ges. **30**: 290. 1912. *Tuburcinia Agropyri* Liro, Ann. Univ. Fenn. Aboen. A. **1**[1]: 15. 1922.

Add, under POACEAE:

**Agropyron pauciflorum* (*A. tenerum*), Utah.
Agropyron repens, Indiana, New Hampshire, New York, Pennsylvania; Quebec.
Agropyron spicatum (*A. divergens*), Oregon.
**Agropyron* sp., Missouri; Manitoba.
**Agrostis alba* (*A. palustris*), Wisconsin.
**Bromus marginatus*, Washington.
Elymus canadensis, Indiana, Mississippi, New Mexico, Utah.
**Elymus condensatus*, Washington, Wyoming.
**Elymus glaucus*, Colorado, Idaho.
Elymus mollis (*E. arenarius*), Washington.
**Elymus striatus*, Missouri, Oklahoma.
Elymus virginicus, Indiana.
Elymus sp., Arkansas, New York, Pennsylvania, Tennessee, West Virginia; Alberta.
**Festuca Kingii* (*F. confinis*), Utah.
**Festuca rubra*, California.
**Glyceria striata* (*G. nervata, Panicularia nervata*), New York.
**Hordeum nodosum*, Oregon.
**Koeleria cristata*, Arizona.
**Melica imperfecta*, California.
***Poa pratensis*, Iowa, Pennsylvania.

Add the illustration: Beitr. Krypt. Schweiz 3^2: 134. *f. 67.*

Add the note: On *Melica imperfecta* the number of spores in the balls is more frequently 3 or rarely 4 and the spore-balls are correspondingly larger, but it is doubtful if these variations merit specific distinction, as was recognized by Magnus for *U. Bornmülleri* on *M. Cupani* from Syria.

58. Insert:

10a. **Urocystis Fischeri** Körn. Hedwigia **16**: 34. 1877.

Urocystis Agropyri Fisch. de Waldh. Bull. Soc. Nat. Mosc. 40^1: 258. 1867.
Tuburcinia Fischeri Liro, Ann. Univ. Fenn. Aboen. 1^1: 29. 1922.

Sori chiefly on leaves, rarely on culms, forming more or less elongate striae of embedded dark-colored spore-balls; spore-balls completely covered with thin lighter-colored sterile cells smaller than the spores, chiefly 20–40 μ in length; spores 1–3 (usually 1, rarely 3) in a ball, dark-reddish-brown, subspheric to irregularly elongate, 14–20 μ in length.

ON CYPERACEAE:
Carex atherodes, Manitoba.
Carex triquetra, California.
TYPE LOCALITY: Germany, on *Carex acuta*.
DISTRIBUTION: California; Manitoba; also in Europe.
ILLUSTRATION: Beitr. Krypt. Schweiz 3^2: *f. 67.*
EXSICCATI: Rab. Fungi Eur. *4105;* Vesterg. Micr. Rar. Sel. *189.*

58. **Urocystis Junci.**

Add the synonym: *Tuburcinia Junci* Liro, Ann. Univ. Fenn. Aboen. A. 1^1: 33. 1922.
Insert: ILLUSTRATION: Beitr. Krypt. Schweiz 3^2: *f. 68.*

58. **Urocystis granulosa.**

Add the synonym: *Tuburcinia granulosa* Liro, Ann. Univ. Fenn. Aboen. A. 1^1: 25. 1922.

58. Insert:

12a. **Urocystis Fraserii** Clinton & Zundel, sp. nov.

Sori in the upper parts of the stems, involving the inflorescence, chiefly the rachis, surrounding the whole stem or running out in narrow lines, first covered by a thin epidermis through which the granular black spore-mass can be seen; spore-balls opaque, tightly and apparently very permanently compacted, subspheric to oblong, chiefly 35–75 μ in length; sterile cells not very evident, tightly investing the spore-balls, rather indefinite even under pressure, lighter-colored and considerably smaller than the spores; spores dark-reddish-brown, not easily separated under pressure, chiefly irregular through pressure, smooth, but often with sterile cells or fragments adhering, 6–20, chiefly 10–15, in a ball, 16–23 μ in length. (See page 1029.)

ON POACEAE:
Stipa comata, Saskatchewan.
Type collected at Saskatoon, Saskatchewan, on *Stipa comata*, by W. B. Fraser and J. W. Scannell, June 5, 1922 (herb. U. S. Dept. Agr.).
DISTRIBUTION: Saskatchewan.
NOTE: Determined by the collectors as *Urocystis granulosa* Clinton, but, while apparently on the same host, decidedly different microscopically in that the spore-balls are more opaque, larger, and with a greater number of larger spores; the envelope of sterile cells is also much less distinctly made out.

59 **Urocystis Hypoxyis.**

Add the synonym: *Tuburcinia Hypoxys* Liro, Ann. Univ. Fenn. Aboen. A. 1^1: 39–40. 1922.

Add, under AMARYLLIDACEAE:
**Hypoxis domingensis*, Santo Domingo.

59. Insert:

13a. **Urocystis Giliae** Speg. Ann. Mus. Nac. Buenos Aires III. **12**: 294. 1909.

Tuburcinia Giliae Liro, Ann. Univ. Fenn. Aboen. A. 1^1: 101. 1922.

Sori forming conspicuous, usually ellipsoid nodules, about 7–15 mm. long, on roots, at first firm and whitish, then grayish and finally showing black subgranular contents; spore-balls reddish-brown, subopaque to opaque, irregular, oblong to subspheric, chiefly 30–45 μ, occasionally 27–60 μ in length; sterile cells rather incompletely and closely but obscurely covering fertile cells, dark-reddish-brown, usually rather thick-walled, subspheric and frequently flattened, 8–15 μ in length; spores chiefly 1–3 or rarely more in a ball, ovoid to subspheric, difficult to separate from cortex-cells, 16–20 μ in length.

ON POLEMONIACEAE:
Gilia sp., Wyoming.
TYPE LOCALITY: Puerto del Inca, Argentina, on *Gilia foetida*.
DISTRIBUTION: Wyoming; also in Argentina.
NOTE: This is the first report of this smut in North America. It was collected at Lander, Wyoming, by J. P. Bennett and communicated to us by J. J. Davis. It differs from *Urocystis coralloides* Rostrup, the only other *Urocystis* on roots reported in America, by having darker-colored sterile cells and a quite different host.

13b. **Urocystis coralloides** Rostr. Bot. Centr. **5**: 126. 1881.

Urocystis Sophiae D. Griff. Bull. Torrey Club **34**: 209. 1907.

Sori occurring chiefly as wart-like tubercles on the upper portion of the roots, usually about 2 cm. below the surface of the ground, irregular, consisting of spore-balls finely packed together, 1 mm. to 1 cm. or sometimes larger; spore-balls subspheric, somewhat irregular, chiefly with 1–3 or sometimes 4 spores completely surrounded by yellowish-tinted sterile cells, chiefly 30–40 μ in diameter; spores spheric to subspheric, often flattened due to compression, dark-reddish-brown, smooth, 15–17 μ in diameter.

ON CRUCIFERACEAE:
Descurainea andrenarum, Arizona.
TYPE LOCALITY: Denmark, on *Turritis glabra*.
DISTRIBUTION: Arizona; also in Denmark.

60. **Entyloma lineatum.**

Add the synonym: *Entyloma Oryzae* Sydow, Ann. Myc. **12**: 197. 1914. (Type from Philippine Islands, on *Oryza sativa*.)

Add, under POACEAE:

**Oryza sativa*, Louisiana.
Zizania aquatica, Delaware, District of Columbia, Indiana, Michigan, Minnesota, New Jersey.

60. **Entyloma crastophilum.**

Add the synonym: *Entyloma Catabrosae* Johans. Oefv. Sv. Vet.-Akad. Förh. **41**[9]: 160. 1885.

Add, under POACEAE:

**Glyceria pallida*, Wisconsin.
**Muhlenbergia asperifolia* (*Sporobolus asperifolius*), Utah.
**Muhlenbergia mexicana*, Indiana.

Add the note: Ciferri (Ann. Myc. **26**: 20. 1928) gives *Entyloma Brefeldii* with *Entyloma crastophilum* on *Holcus lanatus* as a synonym of a new species which he calls *Entyloma Sydowianum* Cif. *Entyloma Brefeldii* was described by Krieger (Hedwigia **35**: (145) 1896) on *Phalaris arundinacea*. Sydow issued several specimens in his exsiccati under this name, but on *Holcus lanatus*, one of which (Rab. Fungi Eur. *4202*) was sent to him by Krieger. This fungus makes no spots that can be seen in the old dried leaves, and the spores are chiefly spheric and hyaline to light-yellow, so that to us it seems to be quite different from the species with darker-colored and often angular spores that makes distinct black spots on the leaves produced by *Entyloma crastophilum*.

60. **Entyloma irregulare.**

Add, under POACEAE:

Poa pratensis, Michigan, Pennsylvania.

60. **Entyloma speciosum.**

Add, under POACEAE:

Panicum dichotomiflorum (*P. proliferum*), Indiana, Louisiana, Maryland.
**Sporobolus argutus*, Santo Domingo.

Add the exsiccati: Ciferri, Myc. Doming. Exs. *96* (erroneously issued as *Tolyposporella Sporoboli* (Ellis & Ev.) Jackson).

61. Insert:

5a. **Entyloma parvum** Davis, Trans. Wis. Acad. **19**: 715. 1919.

Sori in the culms, black, linear, appearing as small fusiform galls, which dehisce as longitudinal fissures, 0.5–1 mm. in length; spores yellowish-brown, packed and rather firmly agglutinated, ovoid to subspheric or somewhat angular due to compression, smooth, with moderately thick walls, chiefly 7–10 μ in diameter.

ON CYPERACEAE:
Eleocharis acicularis, Massachusetts, Wisconsin.
TYPE LOCALITY: Plover, Wisconsin, on *Eleocharis acicularis*.
DISTRIBUTION: Massachusetts and Wisconsin.

61. **Entyloma Thalictri.**

Add, under RANUNCULACEAE:

**Thalictrum dasycarpum*, Wisconsin.
Thalictrum dioicum, Indiana; Manitoba.
Thalictrum polygamum, New Hampshire.
**Thalictrum* sp., New York.

61. **Entyloma Ranunculi.**

Add, under RANUNCULACEAE:

**Ranunculus Bongardi*, Colorado, Oregon.
**Ranunculus delphinifolius*, Indiana.
**Ranunculus Macounii*, Manitoba.
**Ranunculus septentrionalis*, Maine.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 59*.

61. Insert:

7a. **Entyloma Meliloti** McAlpine, Smuts Austr. 195. 1910.

Sori in the leaves, ovate, somewhat pustulate at margin, 0.5–1 mm. in diameter, but often confluent and then larger, with a light-colored center and a darker-colored margin, showing on both surfaces of the leaves; spores hyaline to yellowish or golden, chiefly subspheric, sometimes slightly angled through pressure, with a moderately thick epispore, chiefly 10–14 μ in diameter; conidia frequent, showing on the under side of the leaf as whitish growth, hyaline, cylindric, slightly bent, 2–2.5 $\times$ 28–32 μ.

ON LEGUMINOSAE:
Melilotus indica, Alabama, Louisiana; Bermuda.
TYPE LOCALITY: Werribee, Victoria, Australia, on *Melilotus indica*.
DISTRIBUTION: Alabama; Bermuda; also in Australia.
ILLUSTRATION: McAlpine, Smuts Austr. *pl. 56, f. 226*.

61. **Entyloma Menispermi.**

Add, under MENISPERMACEAE:

Menispermum canadense, Indiana, Ohio, Pennsylvania, South Dakota, West Virginia; Alberta, Manitoba, Ontario.

62. **Entyloma compositarum.**

Add the synonyms: *Entyloma incertum* Ciferri, Ann. Myc. **26**: 38. 1928. (On *Bidens chrysanthemoides*.) *Entyloma Eupatorii* Ciferri, Ann. Myc. **26**: 38. 1928. (On *Eupatorium urticaefolium*.) *Entyloma wisconsiniense* Ciferri, Ann. Myc. **26**: 40. 1928. (On

Senecio aureus.) *Entyloma Helenii* Ciferri, Ann. Myc. **26**: 40. 1928. (On *Helenium autumnale.*) *Entyloma lepachydis* Ciferri, Ann. Myc. **26**: 41. 1928. (On *Lepachys pinnata.*) *Entyloma anceps* Ciferri, Ann. Myc. **26**: 44. 1928. (On *Rudbeckia laciniata.*) *Entyloma Boltoniae* Ciferri, Ann. Myc. **26**: 47. 1928. (On *Boltonia asteroides.*) *Entyloma Madiae* Ciferri, Atti Ist. Bot. Pavia III. **1**: 88. 1924. (On *Madia glomerata.*)

Add, under AMBROSIACEAE:

Ambrosia artemisiifolia, Indiana, New York, Pennsylvania, South Dakota; Ontario.
Ambrosia trifida, Colorado, Connecticut, Delaware, Maryland, New York, North Dakota, Pennsylvania; Alberta, Manitoba, Ontario.

Add, under CARDUACEAE:

**Aster adscendens*, Wyoming.
Aster sp., Pennsylvania; Manitoba.
Bidens laevis (*B. chrysanthemoides*), Wisconsin.
**Bidens tenuisecta*, New Mexico.
**Bidens vulgata*, Wisconsin.
**Bidens* sp., New Brunswick, Nova Scotia.
**Boltonia asteroides*, Wisconsin.
**Chrysopsis asprella* (*C. arida*), Colorado.
**Chrysopsis villosa*, Colorado.
**Erigeron Coulteri*, Utah.
**Erigeron glabellus*, Colorado.
**Erigeron macranthus*, Colorado.
Erigeron salsuginosus, Wyoming.
**Erigeron subtrinervis*, Colorado.
Eupatorium urticaefolium (*E. ageratoides*), Mississippi, West Virginia, Wisconsin.
Lepachys pinnata (*Ratibida pinnata*), Kansas.
**Madia glomerata*, North Dakota.
**Madia* sp., Oregon.
Rudbeckia laciniata, Illinois, Iowa, Wisconsin.
Senecio aureus, Indiana, Kansas, Pennsylvania.
**Senecio Fendleri*, Colorado.
**Senecio Robbinsii*, New York.

Add, under CICHORIACEAE:

**Agoseris* sp., Manitoba.

Add the exsiccati; Brenckle, Fungi Dak. *582*, *1009;* Barth. Fungi Columb. *3223*, *3319*, *5014;* Seym. & Earle, Econ. Fungi *292a*, *292b*, *294b*.

62. Insert:

9a. **Entyloma Achilleae** Magnus, Abh. Nat. Ges. Nürnberg **13**: 8. 1900.

Sori on the linear divisions of the leaves, rather indefinite, causing premature withering; spores scattered sparsely through the tissues, hyaline to light-yellow, subspheric to spheric, with evenly and moderately thick walls, 10–15 μ in diameter; conidia forming aerial tufts, chiefly fusiform, about 2–3 μ thick in the middle and tapering to one or both ends, often somewhat curved, 10–16 μ in length.

ON CARDUACEAE:
Achillea Millefolium, Manitoba.
TYPE LOCALITY: Germany, on *Achillea Millefolium*.
DISTRIBUTION: Canada; also in Europe.
NOTE: Spores very similar to those of *E. compositarum;* species doubtfully distinct.

62. **Entyloma polysporum.**

Add the synonym: *Entyloma Davisii* Ciferri, Ann. Myc. **26**: 43. 1928. (On *Rudbeckia hirta.*)

Add, under AMBROSIACEAE:

Ambrosia artemisiifolia, New Hampshire.
Ambrosia trifida, Colorado, Indiana, Wisconsin.

Add, under CARDUACEAE:

**Gaillardia aristata*, Colorado; Manitoba.
Gaillarida pulchella, Nebraska.
**Gaillardia* sp., Minnesota.

**Helenium autumnale*, Montana.
**Lepachys columnifera* (*Ratibida columnaris*), South Dakota. (Reported in Brenckle, Fungi Dak. *661* as *E. compositarum*.)
**Rudbeckia hirta*, Wisconsin; Ontario.

Add the exsiccati: Barth. Fungi Columb. *3424*, *4820*, *4917;* Sydow, Ust. *416;* Brenckle, Fungi Dak. *661*.

Add the note: On *Helenium* and *Lepachys* the spores are somewhat smaller than usual.

63. Insert:

11a. **Entyloma Dahliae** Sydow, Ann. Myc. **10**: 36. 1912.

Sori in leaves, with definite margin, subcircular to elliptic, somewhat irregular, dark-brown, showing on both surfaces of the leaf, 3–12 mm. in length; spores chiefly light-yellow, spheric to subspheric, thick-walled, smooth, 9–14 μ in diameter; conidia not reported.

ON CARDUACEAE:
Dahlia coccinea, Guatemala.
Dahlia variabilis, New Jersey.
Dahlia sp., Guatemala.
TYPE LOCALITY: Harden Heights, Natal, Union of South Africa, on *Dahlia variabilis*.
DISTRIBUTION: New Jersey; Guatemala; also in South Africa and Europe.
ILLUSTRATIONS: Gard. Chron. III. **84**: 393; Jour. Royal Hort. Soc. **57**: *f. 115–118*.

11b. **Entyloma Calendulae** (Oud.) DeBary, Bot. Zeit. **32**: 105. 1874.

Protomyces Calendulae Oud. Arch. Neerl. **8**: 384. 1873.
Protomyces Hieracii Berk.; Cooke, Grevillea **12**: 99, as synonym. 1884.
Entyloma Erigerontis Sydow, Ann. Myc. **16**: 244; hyponym. 1919.

Sori in leaves forming rather definite greenish-yellow to dark-brown subcircular spots, often with a limiting darker ring, more or less thickened, showing on both surfaces, up to 5–6 mm. in diameter; spores yellowish or old specimens occasionally darker-colored, massed rather firmly together, with medium-thick to thick double walls which may show signs of a gelatinous hyphal filament at one side, subcircular to somewhat angular through pressure, chiefly 10–16 μ in diameter.

ON CARDUACEAE:
Calendula officinalis, New York.
TYPE LOCALITY: Utrecht, Holland, on *Calendula officinalis*.
DISTRIBUTION: New York; also in Europe.
ILLUSTRATIONS: Beitr. Krypt. Schweiz 3^2: *f. 58;* Arch. Nat. Land. Böhmen 15^3: *f. 21*.
NOTE: It is very doubtful if *E. polysporum*, *E. Holwayi*, and *E. arnicale* are distinct from this species. All are large-spored forms with double often thick spore-walls, in contrast with the thinner-walled spores of *E. compositarum;* however, they are maintained until further studies can be made.

11c. **Entyloma Circaeae** Dearness, sp. nov.

Sori on the leaves, angular, at first yellowish below but eventually reddish-brown on both sides, chiefly 1–4 mm. in diameter; spores in densely agglutinated masses and not easily separated under pressure without injury, when mature showing reddish-brown in mass, ovoid to chiefly subspheric or spheric, thick-walled and often with indications of hyaline papillae, but the outer wall may be broken by pressure and then the spores appear smooth and lighter-colored, 10–16 μ long. (See page 1030.)

ON ONAGRACEAE:
Circaea alpina, Oregon.
Type collected in Mt. Hood National Forest, Oregon, on *Circaea alpina*.
DISTRIBUTION: Known only from the type locality.
NOTE: This agrees fairly well with *E. Chrysosplenii* as we have seen it on *Chrysosplenium alternifolium* from Europe.

63. **Entyloma arnicale.**

Add, under CARDUACEAE:

Arnica cordifolia, Colorado, Montana (collected by Kelsey and used as type for *Ramularia arnicale* Ellis & Ev.; Sacc. Syll. Fung. **10**: 557. 1892), Wyoming.

**Arnica fulgens*, Colorado.
**Arnica subplumosa*, Colorado, Utah.

Add the exsiccati: Barth. Fungi Columb. *2368*.

63. Entyloma guaraniticum.

Add, under CARDUACEAE:

**Bidens pilosa*, Santo Domingo; Puerto Rico.

63. Entyloma Floerkeae.

Add, under LIMNANTHACEAE:

Floerkea proserpinacoides, Delaware, Indiana, New York, West Virginia.

63. Insert:

14a. Entyloma bavaricum Sydow, Ann. Myc. **22**: 245. 1924.

Sori in the leaves, showing on both sides, oval to circular, thin, 3–5 mm. in length, at first light-yellow but the center later becoming deep-reddish-brown; spores rather firmly united, hyaline to light-yellow, regular, spheric or subspheric or sometimes angular by compression, with a wall about 1.5 to 2 μ thick, smooth, 9–12 μ in length or longer when compressed; conidia not observed.

ON CARDUACEAE:
Senecio pauciflorus, Washington.
TYPE LOCALITY: Bavarian Forest near Eisenstein, Bavaria, on *Senecio rivularis*.
DISTRIBUTION: Washington; also in Bavaria.
NOTE: This is the first report of this species in North America. It was collected by G. G. Hedgcock in Blewett Pass, Washington, August 1, 1934, and communicated by J. Dearness. It is closely related to *Entyloma Bellidis* Krieger and *Entyloma Saccardianum* Scalia. Dearness reports hypophyllous conidia present.

14b. **Entyloma Agoseridis** Zundel, sp. nov.

Sori in the leaves, whitish, showing on both sides, circular with a very distinct margin, but sometimes coalescing, regular, 3–4 mm. in diameter, thin; spores hyaline or tinted yellow, chiefly spheric to subspheric, sometimes ellipsoid, occasionally angular by compression, with moderately thin cell-wall (not more than 1 μ), chiefly 9–12 μ in length; conidia not observed. (See page 1030.)

ON CICHORIACEAE:
Agoseris purpurea (*Troximon purpureum*), Colorado.
Type collected in *Agoseris purpurea*, by L. O. Overholts & L. T. Dennison, above Eldora, Colorado, at an altitude of 3000 meters, July 31, 1926. (Overholts Herbarium *16916*.)

63. Entyloma Collinsiae.

Add, under SCROPHULARIACEAE:

**Collinsia grandiflora*, Oregon.
**Collinsia tenella*, Oregon.

64. Entyloma Lobeliae.

Add, under LOBELIACEAE:

**Lobelia Cliffortiana*, Santo Domingo; Puerto Rico.
Lobelia inflata, Indiana, New York, Pennsylvania, Vermont, West Virginia.
**Lobelia spicata*, Pennsylvania.

64. Entyloma australe.

Add, under SOLANACEAE:

Physalis heterophylla, Pennsylvania; Ontario.
Physalis lanceolata, Manitoba.
Physalis longifolia, Colorado, Nebraska.
**Physalis neomexicana*, New Mexico.
**Physalis pruinosa*, New York.
Physalis pubescens, Iowa, Missouri, Virginia; Puerto Rico.
**Physalis rotundata*, Colorado.
Physalis subglabrata (*P. philadelphica*), Illinois, New York, Pennsylvania.

**Physalis turbinata*, Santo Domingo.
Physalis virginiana, North Dakota.
**Physalis viscosa*, Florida.
Physalis sp., Arkansas, West Virginia.
**Quincula lobata*, Colorado.
Solanum triflorum, Colorado, New Mexico; Manitoba.

Add the exsiccati: Barth. Fungi Columb. *3520*, *4019;* Rab. Fungi Eur. *4402;* Brenckle, Fungi Dak. *528*.

64. **Entyloma serotinum.**

Add, under BORAGINACEAE:

**Lappula floribunda*, Utah.
Mertensia virginica, District of Columbia, Virginia.

Add the note: Conidia were present on both of the above hosts (see page 64).

64. **Entyloma Saniculae.**

Add, under AMMIACEAE:

**Sanicula canadensis*, New York.
**Sanicula gregaria*, Wisconsin.
Sanicula marylandica, Maryland.
Sanicula sp., Oregon.

65. **Entyloma Linariae.**

Add, under SCROPHULARIACEAE:

Linaria vulgaris, Illinois, New York, Pennsylvania.

65. Insert:

21a. **Entyloma Veronicae** (Wint.) Lagerh.; Pat. & Lagerh. Bull. Soc. Myc. Fr. **7**: 170. 1891.

Entyloma Linariae var. *Veronicae* Wint.; Rab.-Wint. Fungi Eur. *3001*. 1884.
Entyloma Linariae f. *Veronicae* Halsted, Bull. Torrey Club **17**: 96. 1890.

Sori appearing as yellowish or whitish, well-defined spots on both surfaces of the leaves; spores deep-tinted, dark, 13–16 μ or the most elongate sometimes 19 μ in length; conidia described as 27–30 $\mu \times 2$ μ.

ON SCROPHULARIACEAE:
Veronica americana, Colorado, New York.
Veronica peregrina, Connecticut, Illinois, Indiana, Iowa, Maryland, Mississippi, Missouri, Wisconsin.
TYPE LOCALITY: Perryville, Missouri, on leaves of *Veronica* sp.
DISTRIBUTION: Connecticut to Wisconsin and Colorado; also in Ecuador.
EXSICCATI: Rab.-Wint. Fungi Eur. *3001;* Ellis, N. Am. Fungi *1487;* Seym. & Earle, Econ. Fungi *C20*.
NOTE 1: This was treated on page 65 as *Entyloma Linariae* var. *Veronicae*.
NOTE 2: Farlow (Bot. Gaz. 8: 275. 1883) reports *Entyloma Linariae* on *Veronica peregrina* from Wisconsin, collected by Trelease.

65. Insert:

21b. **Entyloma Clintonianum** Zundel & Dunlap, sp. nov.

Sori yellowish or reddish-brown, subcircular, showing on both surfaces of the leaf, about 1–2 mm. in diameter; spores spheric to subspheric, though occasionally somewhat flattened laterally by pressure, yellowish or very light-reddish-brown, with moderately thick cell-wall, chiefly 10–14 μ in diameter; conidia not observed. (See page 1030.)

ON SCROPHULARIACEAE:
Mimulus floribundus, Washington.
Type collected at Longmire Springs, Rainier National Park, Washington, on *Mimulus floribundus*, by C. V. Piper, June 28, 1895.
DISTRIBUTION: Rainier National Park.
NOTE: Clinton received this from Farlow and wrote most of the above description, without a specific name. He made the following observations, which were filed with the specimen: "I have not been able to find any *Entyloma* reported on *Mimulus*. *Linaria*, *Veronica*, and *Collinsia* are the only other genera of the *Scrophulariaceae* on which entylomas have been reported, unless recently. It seems to agree best with *E. Collinsiae*. It differs from *E. Linariae*

in the absence of double spore-walls and from *E. Linariae Veronicae* and *E. veronicicola* (not yet reported in America but evidently very similar to the preceding species) in smaller, more regular spores, without double wall."

21c. **Entyloma Gratiolae** (Davis) Ciferri, Ann. Myc. **26**: 42. Ja 1928.

Entyloma Linariae var. *Gratiolae* Davis, Trans. Wis. Acad. **21**: 262. [Jl] 1924.

Sori in the leaves, showing on both sides, yellowish-white, subcircular, about 1 mm. in diameter; spores crowded, yellowish, with evident double wall, with epispore nearly smooth to usually distinctly verrucose, ovoid to chiefly subspheric or spheric, 13–18 μ in length; conidia not observed.

ON SCROPHULARIACEAE:
Gratiola virginiana, Wisconsin.
DISTRIBUTION: Wisconsin.

66. **Entyloma fuscum.**

Add, under PAPAVERACEAE:

**Papaver Rhoeas*, Bermuda.
**Papaver somniferum*, Bermuda.

Insert: ILLUSTRATION: Beitr. Krypt. Schweiz **3**[2]: *f. 57.*

66. **Entyloma microsporum.**

Add, under RANUNCULACEAE:

Ranunculus septentrionalis, Indiana, Maine, New York.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 60.*

66. **Entyloma Nymphaeae.**

Add, under NYMPHAEACEAE:

Castalia odorata, New York.
Castalia tuberosa, Ontario, Nova Scotia; Puerto Rico.
Castalia sp., District of Columbia, Indiana.
Nymphaea advena (*Nuphar advena*), Manitoba.

66. Add the doubtful species:

Entyloma Browalliae H. Sydow, Ann. Myc. **23**: 326. 1925. Sori in the leaves, forming orbicular, yellowish or brownish spots, 2–4 mm. in diameter; spores globose to subglobose or angular, smooth, yellowish, 10–12 μ in diameter, the wall of uniform thickness, 2–3 μ. ON SOLANACEAE: *Browallia demissa*, Costa Rica. Specimens of this species were not available to us for study.

Entyloma bullulum Ciferri, Nuovo Giorn. Bot. Ital. II. **40**: 252. 1933. ON CARDUACEAE: *Sonchus oleraceus*, Santo Domingo. We have seen no specimen of this smut, whose spores are given as 10–14 μ in diameter. It is closely related to or identical with *E. compositarum*.

Entyloma costaricense Ciferri, Nuovo Giorn. Bot. Ital. II. **40**: 260. 1933. ON CARDUACEAE: *Viguiera silvatica*, Costa Rica. We have seen no specimens of this smut, whose spores are given as 10–11 μ in diameter, with a cell-wall about 1.5 μ thick. It is closely related to or identical with *E. compositarum*.

Entyloma Farisii Ciferri, Ann. Myc. **26**: 11. 1928. ON POACEAE: *Tricholaena rosea*, Santo Domingo. We have seen no specimen of this species, whose spores are given as 9.5–14.5 μ. This is the only smut reported on *Tricholaena*, though *Entyloma speciosum* is recorded on *Panicum* sp., *Tricholaena* being considered by some writers as a synonym of *Panicum*.

Entyloma occultum Ciferri, Ann. Myc. **26**: 10. 1928. ON CARDUACEAE: *Erigeron spathulatus*, Santo Domingo. We have seen no specimen of this species, whose spores are given as mostly 13–17 μ to 11–21 μ. Three other species of *Entyloma* have been reported on the genus *Erigeron*, but none of these are on this host-species.

Entyloma Polygoni-punctati Ciferri, Ann. Myc. **26**: 11. 1928. ON POLYGONACEAE: *Persicaria punctata* (*Polygonum punctatum*), Santo Domingo; *Persicaria spectabilis* (*Polygonum spectabile*), Santo Domingo. We have seen no specimen of this species, whose spores are given as 6–8.5 μ, usually 7 μ. There is no other *Entyloma* reported on these species although seventeen or more smuts have been listed on *Polygonum*.

Entyloma Sidae-rhombifoliae Ciferri, Ann. Myc. **26**: 11. 1928. ON MALVACEAE: *Sida rhombifolia*, Santo Domingo. We have seen no specimen of this *Entyloma*, which is apparently the only smut on this host-genus or its family. Ciferri gives the spores as 10.5–14.7 μ, or usually 11.5–13 μ.

67. **Burrillia decipiens.**

Add, under MENYANTHACEAE:

Limnanthemum lacunosum, New York; Ontario.

67. Insert:

1a. **Burrillia Limnanthemi** Ciferri, Ark. Bot. **23A**[14]: 22. 1931.

Sori on the leaves, forming irregular, isolated, scattered, yellowish spots, 2–3 mm. in length; spore-balls with spores surrounding a central layer of subpolyhedric parenchymatous cells, 37–45 $\mu \times$ 44–52 μ, light-yellowish-brown; spores elongate, subpolyhedric, light-yellowish, with a thick (2 μ) smooth epispore, 15–19 $\mu \times$ 4–6 μ.

ON MENYANTHACEAE:
Limnanthemum Humboldtianum, Santo Domingo.
TYPE LOCALITY: Between Guerra and Cuenca, Llano Costero, Santo Domingo, on *Limnanthemum Humboldtianum*.
DISTRIBUTION: Santo Domingo.
NOTE: We have not seen a specimen of this species, but our description is based on that of Ciferri, who also states that it differs from *Burrillia decipiens* on the same host-genus in habit, in size and form of the spore-balls, and in size of spores and parenchymatous cells.

67. **Burrillia Echinodori.**

Add, under ALISMACEAE:

Echinodorus cordifolius, Puerto Rico, Santo Domingo.

Add: EXSICCATI: Barth. Fungi Columb. *5002*.

67. **Burrillia pustulata.**

Add, under ALISMACEAE:

Sagittaria latifolia (*S. variabilis*), Ontario.

Add the exsiccati: Sydow, Ust. *500*.

67. Insert:

4. **Burrillia Acori** Dearness, sp. nov.

Sori causing discoloration of tissues but imbedded in lacunae within the leaf and revealed only upon splitting this open; spore-balls one or more in a lacuna, sometimes surrounded by whitish fluffy mycelium as if immature, elongate to subspheric, yellowish but probably darker with age, about 150–200 μ in length; spores variable as if loosely arranged, smooth, yellowish, chiefly oval to subspheric, 10–15 μ in length. (See page 1030.)

ON ARACEAE:
Acorus Calamus, Ontario.
Type collected at pond near Hespeler, Wellington County, Ontario, on *Acorus Calamus*, by Dearness (*no. 6306*), August 2, 1913.
DISTRIBUTION: Known only from the type locality.

68. **Doassansia Epilobii.**

Add, under ONAGRACEAE:

**Epilobium* sp., Colorado.

68. Insert:

1a. **Doassansia Downingiae** Liro, Ann. Bot. Vanamo **6**[1]: 2. 1935.

Sori in leaves, amphigenous, forming small elongate violet-brown spots, with the spore-balls showing as minute papillae; other sori on stems, violet-brown; spore-balls with a distinct cortex and a spore-mass entirely filling the interior, irregularly spherical to cylindric, 75–200 μ in length; cortical cells yellowish-brown, irregularly spherical to polygonal or obovate, often only 3–5 μ in diameter but sometimes up to 10 μ in length,

the walls finely punctate, up to 2.5 μ thick; spores yellowish, subspherical to polyhedral, 10–14 μ in length, the wall about 1 μ thick.

ON LOBELIACEAE:
Downingia elegans (*Bolelia elegans*), Idaho.
TYPE LOCALITY: Lake Coeur d'Alene, "Palouse" [Kootenai] County, Idaho, on *Downingia elegans*.
DISTRIBUTION: Known only from the type locality.

68. Insert:

1b. **Doassansia Callitriches** Jackson & Linder; Linder, Mycologia **30**: 669. 1938.

Sori not clearly defined; spore-balls in the mesophyll of leaves or cortex of stems, scattered, prominent, dark-brown, globoid or depressed-ellipsoid, 140–170 μ in diameter; spores angularly subgloboid, 11–14 μ, or ellipsoid, 9.5–13 μ × 12.5–16 μ, the walls thin, 1 μ or less, colorless or slightly yellowish; cortical cells slightly larger than the spores but more irregular, the walls chestnut-brown, 1.5 μ thick, finely and closely internally verrucose.

ON CALLITRICHACEAE:
Callitriche marginata var. *longipedunculata*, California.
TYPE LOCALITY: Puddingstone Dam, San José Hills, Los Angeles, California, on *Callitriche marginata* var. *longipedunculata*.
DISTRIBUTION: Southern California.
ILLUSTRATION: Mycologia **30**: 670. *f. 10*.

68. **Doassansia ranunculina.**

Add, under RANUNCULACEAE:

Ranunculus delphinifolius, Maryland; Manitoba.

69. **Doassansia Sagittariae.**

Add, under ALISMACEAE:

**Lophotocarpus calycinus*, Wisconsin.
Sagittaria arifolia, Wisconsin, Wyoming; Saskatchewan.
Sagittaria latifolia (*S. variabilis*), Connecticut, Indiana, Montana, North Dakota; Manitoba.
Sagittaria rigida (*S. heterophylla*), Indiana.
Sagittaria sp., Arkansas, South Dakota.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 61*.

Add the exsiccati: Barth. Fungi Columb. *4319;* Brenckle, Fungi Dak. *253*.

Doassansia Sagittariae var. **confluens** Davis, Trans. Wis. Acad. **14**: 92. 1903. ON ALISMACEAE: *Sagittaria rigida* (*S. heterophylla*), Wisconsin. This differs from the species by the larger sori, which are frequently confluent.

69. **Doassansia Alismatis.**

Add, under ALISMACEAE:

Alisma Plantago-aquatica, Michigan, Montana, North Dakota; Manitoba, Ontario.
**Alisma subcordatum*, Manitoba.

Add the illustration: Beitr. Krypt. Schweiz **3**[2]: *f. 62*.

Add the exciccati: Brenckle, Fungi Dak. *202;* Sydow, Ust. *461*.

69. **Doassansia opaca.**

Add, under ALISMACEAE:

Sagittaria latifolia (*S. variabilis*), Indiana, Wisconsin.

70. **Doassansia occulta.**

Add, under ZANNICHELLIACEAE:

**Potamogeton epihydrus*, Maryland, New York.

70. Insert:

6a. **Doassansia furva** Davis, Trans. Wis. Acad. **19**: 704. 1919.

Sori in the leaves, forming dark spots with evidence of the spore-balls as grouped pimples in the center; spore-balls in the parenchyma in a single layer or loosely clustered,

dark-brown, oval to spheric more irregular when clustered 100–150 μ in length; cortical cells inconspicuous, often flattened, 6–17 μ wide; spores in a single layer surrounding a central parenchyma, yellowish, ellipsoid to subspheric, or angled through pressure, 9–17 μ in length.

ON ALISMACEAE:
Sagittaria latifolia (*S. variabilis*), Manitoba.
Sagittaria rigida (*S. heterophylla*), Wisconsin.
TYPE LOCALITY: Arcadia, Wisconsin, on *Sagittaria heterophylla*.
DISTRIBUTION: Wisconsin and Manitoba.

70. Doassansia Martianoffiana.

Add, under ZANNICHELLIACEAE:

**Potamogeton epihydrus*, Ontario.
**Potamogeton heterophyllus*, Michigan; Manitoba.
Potamogeton natans, Maine; Manitoba, Ontario.

Add the exsiccati: Sydow, Ust. *464*.

70. Doassansia intermedia.

Add, under ALISMACEAE:

Sagittaria arifolia, Saskatchewan.
Sagittaria latifolia (*S. variabilis*), Manitoba, Ontario.

71. Doassansia deformans.

Add, under ALISMACEAE:

Sagittaria latifolia (*S. variabilis*), Indiana, Iowa, Nebraska, New Jersey, New York; Manitoba, Ontario.

71. Add the excluded species:

Doassansia domingensis Ciferri, Ark. Bot. **23A**[14]: 24. 1931. Sori in leaves, causing small, circular, amphigenous, yellowish, well-defined spots without borders, 1.5–2 mm. in diameter; spore-balls more or less regularly spheric to subelongate, with a double ring of spores surrounding a central body of parenchymatous cells, 140–160 μ in length; cortical cells yellowish, irregularly elliptic-elongate with rather thick walls (2–3 μ), 14–22 μ × 3–8 μ; parenchymatous subpolyhedric, subhyaline, 8–16 μ × 12–14 μ; spores light-brown to brownish-yellow, irregularly subcylindric with rounded ends, generally 7–10 μ × 3–6 μ. ON ZANNICHELLIACEAE: *Potamogeton fluitans* var. *americanus*, Santo Domingo. ILLUSTRATIONS: Ark. Bot. **23A**[14]: *pl. 3, f. 8*. We have not seen this species, but it differs apparently in the smaller spores and larger cortical cells, and according to Ciferri might be considered by some as a variety of *D. Martianoffiana* on the same host-genus.

Doassansia Eichhorniae Ciferri, Ann. Myc. **26**: 11. 1928. ON PONTEDERIACEAE: *Eichhornia crassipes* (*E. speciosa*), Santo Domingo. We have seen no specimen of this *Doassansia* which is the only smut reported on this host-genus or its family. Ciferri gives the spore-balls as 180–200 μ and the spores as 12.5–18 μ in diameter.

Doassansia Limnocharidis Ciferri, Ark. Bot. **23A**[14]: 23. 1931. Sori on leaves, causing more or less round, brown, confluent spots (dirty-white in center and here slightly inflated), with a tendency to form multiple rows parallel to the midrib, rarely toward the margin, 2–3 mm. in diameter; spore-balls in the spongy parenchyma, irregularly spheric to elliptic, with fertile cells generally in a single ring surrounding a parenchymatous center, 100–160 μ in length; cortical cells elongate, subhyaline, with rather thick walls (2–2.5 μ), 10–14 μ × 3–8 μ; parenchymatous cells irregularly polyhedric, subhyaline, 6–10 μ × 3–5 μ; spores firmly adherent elliptic to subelongate, yellowish-brown, with smooth thin epispore, normally 9–13 μ × 4–6 μ. ON ALISMACEAE: *Limnocharis flava*, Santo Domingo. ILLUSTRATIONS: Ark. Bot. **23A**[14]: *pl. 3, f. 10*. We have seen no specimen of this smut, but from Ciferri's description it differs from *Doassansia Alismatis* on the same host-family by being a *Doassansiopsis* instead of a *Eudoassansia*, and apparently has smaller cortical cells and spores.

71. Tracya Lemnae.

Add, under LEMNACEAE:

Spirodela polyrhiza, Manitoba.

LATIN DIAGNOSES OF NEW SPECIES

Ustilago Jacksonii Zundel & Dunlap. (Page 982.)

Soris in culmorum partibus superioribus inflorescentiam abortantibus; sporis saturate rubescenti-brunneis, ovoideis vel subglobosis, granulo-verruculosis, saepius 9–12 μ longis.

Ustilago Alsineae Clinton & Zundel. (Page 991.)

Soris in ovulis, ovoideis vel ellipsoideis, circa 2–3 mm. longis, semina in massam pulverulentem purpureo-nigram mutantis; sporis atropurpureis, saepe subopacis, subglobosis, obscure minutissime sed non profunde reticulatis, saepius 10–14 μ crassis.

Sphacelotheca veracruziana Zundel & Dunlap. (Page 994.)

Soris ovaria complentibus, ovoideis, saepius 1–2 mm. latis, pseudomembrano crasso prominenti irregulariter dehiscenti tectis; sporarum massis pulverulentibus, nigro-brunneis, columellam magnam globosam circumstantibus; membrani cellulis sterilibus forma magnitudineque variabilibus, cohaerentibus, cellulis interioribus saepe binis, hyalinis, tunica crassa, angulatis, subglobosis, quam sporis minoribus; sporis moderate agglutinatis, rubescenti-brunneis, ovoideis vel ellipsoideis, grosse verruculosis, saepius 8–13 μ longis.

Sphacelotheca panamensis Zundel & Dunlap. (Page 995.)

Soris in ovariis, quam glumis pauce brevioribus et in eis occultis, circa 3 mm. longis, linearibus, primo pseudomembrano tectis, dein sporarum massam pulverulentem, postremo columellam tenuiter acuminatam aperientibus; membrana sterile in cellulis subglobosis vel globosis facile separante, cellulis sporas subaequantibus; sporis rubescenti-brunneis, tunica tenui, subregularibus, saepius subglobosis, ut videtur levibus sed summa magnificatione olim minute granularibus, 14–18 μ crassis.

Cintractia Farlowii Clinton. (Page 1000.)

Soris in ovariis, in glumis plus minus omnino occultis, 1–2 mm. latis; sporarum massa primo semiagglutinata sed postremo nigra, subpulverulenti; sporis pseudobicellularibus, saturate rubescenti-brunneis, saepius 10–12 μ longis.

Cintractia striata Clinton & Zundel. (Page 1004.)

C. leucodermati similis; soris culmicolis, 3–6 cm. longis; sporis magis regularibus et minus fragilibus, pallide rubescenti-brunneis, ovoideis vel saepius subglobosis, tunica moderate crassa, semispiraliter striatis, 14–18 μ crassis.

Tilletia Youngii Clinton & Zundel. (Page 1012.)

Soris in ovariis, in glumis occultis, hospitis tela tectis, ellipticis set in apicem styloideum attenuatis, circa 2 mm. longis, etiam in nodis, plantas abortantibus, colore purpureo-rubris; cellulis sterilibus subglobosis, saepe in extremo papillosis, tunica moderata vel tenui, hyalinis, 10–15 μ crassis; sporis subglobosis, hyalinis vel pallide aureis, saepe maturitate aureo-brunneis, prominenter spinose sed maturitate truncate tuberculatis, saepius 23–27 μ crassis.

Urocystis Erythronii Clinton. (Page 1015.)

Soris in foliis, ellipticis, parvis, 1–2 mm. longis sed plus minus confluentibus, ambitu bullas plumbeas sub epidermide facientibus; sporarum glomerulis ovoideis vel subglobosis, aterrime rubescenti-brunneis vel nigro-brunneis, subopacis, cortice permanenti, saepius 25–45 μ longis; sporis 1–5, saturate rubescenti-brunneis, saepius 15–18 μ crassis.

Urocystis Fraserii Clinton & Zundel. (Page 1018.)

Soris in culmi partibus superioribus, inflorescentiam implicantibus, primo epidermide tenui tectis; sporarum glomerulis opacis, compactis, subglobosis vel oblongis, saepius 35–75 μ

longis; cellulis sterilibus subinconspicuis, quam sporis pallidioribus et multo minoribus; sporis saturate rubescenti-brunneis, valde cohaerentibus, levibus, in glomerulo 6–20, saepius 10–15, 16–23 μ longis.

Entyloma Circaeae Dearness. (Page 1022.)

Soris in foliis, angularibus, primo subtus lutescentibus, demum ambitu rubescenti-brunneis, saepius 1–4 mm. latis; sporarum massis densis, maturitate rubescenti-brunneis; sporis ovoideis vel subglobosis, 10–16 μ longis, tunica crassa, saepe hyaline papillatis.

Entyloma Agoseridis Zundel. (Page 1023.)

Soris in foliis, albescentibus, ambitu evidentibus, circularibus, distincte marginatis, regularibus, levibus, 3–4 μ latis; sporis hyalinis vel flavescentibus, subglobosis vel ellipsoideis, saepius 9–12 μ longis, tunica tenui; conidiis non visis.

Entyloma Clintonianum Zundel & Dunlap. (Page 1024.)

Soris in foliis, ambitu evidentibus, flavescentibus vel rubescenti-brunneis, subcircularibus, circa 1–2 mm. latis; sporis globosis olim complanatioribus, flavescentibus vel pallidissime rubescenti-brunneis, tunica moderata, saepius 10–14 μ crassis; conidiis non visis.

Burrillia Acori Dearness. (Page 1026.)

Soris in foliorum lacunis profunde clausis; sporarum glomerulis in lacunis solitariis vel pluribus, elongatis vel subglobosis, flavescentibus vel forsan maturitate obscurioribus, circa 150–200 μ crassis; sporis variabilibus, levibus, flavescentibus, saepius ovalibus vel subglobosis, 10–15 μ longis.

REVISED HOST-INDEX TO THE USTILAGINALES

By John Hendley Barnhart

This host-index combines the original one given on pages 73–82, and here revised, with a new one to the additions on pages 971–1028.

Acetosella vulgaris (*Rumex Acetosella*)
Ustilago Rumicis, 23
Achillea Millefolium
Entyloma Achilleae, 1021
Aconitum columbianum
Urocystis carcinodes, 1014
Urocystis sorosporioides, 56
Aconogonum phytolaccaefolium (*Polygonum phytolaccaefolium*)
Ustilago Piperii, 23
Ustilago punctata, 993
Acorus Calamus
Burrillia Acori, 1026
Actaea alba; A. arguta; A. viridiflora
Urocystis carcinodes, 55, 1014
Aegopogon cenchroides
Ustilago Aegopogonis, 17
Agoseris purpurea
Entyloma Agoseridis, 1023
Agoseris sp.
Entyloma compositarum, 1020
Agropyron caninum
Ustilago bullata, 983
Agropyron cristatum
Ustilago Tritici, 981
Agropyron dasystachyum
Ustilago bullata, 983
Agropyron divergens, see **A. spicatum**
Agropyron occidentale, see **A. Smithii**
Agropyron paucifiorum
Urocystis Agropyri, 1017
Ustilago bullata, 983
Ustilago macrospora, 989
Ustilago striaeformis, 989
Agropyron repens
Tilletia Earlei, 1012
Urocystis Agropyri, 58, 1017
Ustilago hypodytes, 978
Ustilago macrospora, 19, 989
Agropyron Richardsoni, see **A. subsecundum**
Agropyron Smithii (*A. occidentale*)
Tilletia Earlei, 50
Urocystis Agropyri, 58
Ustilago hypodytes, 5, 978
Agropyron spicatum (*A. divergens*)
Urocystis Agropyri, 58, 1017
Ustilago macrospora, 19
Agropyron subsecundum
Ustilago bullata, 983
Agropyron tenerum, see **A. paucifiorum**
Agrostis alba
Urocystis Agropyri, 1017
Agrostis alba var. vulgaris, see **A. tenuis**
Agrostis elata, see **A. perennans var. elata**
Agrostis exarata
Ustilago striaeformis, 989
Agrostis microphylla, see **A. exarata**
Agrostis palustris, see **A. alba**
Agrostis perennans
Ustilago striaeformis, 989
Agrostis perennans var. elata
Tilletia decipiens, 1012
Agrostis tenuis (*A. alba* var. *vulgaris*)
Entyloma crastophilum, 60
Ustilago striaeformis, 18, 989
Alisma Plantago-aquatica; A. subcordatum
Doassansia Alismatis, 69, 1027
Allium Cepa; A. nevadense
Urocystis Cepulae, 57, 1015
Allium Palmeri
Urocystis magica, 1015
Alopecurus carolinianus
Tilletia Youngii, 1012
Alopecurus geniculatus
Entyloma speciosum, 60
Alopecurus ramosus, see **A. carolinianus**
Alsine borealis
Ustilago violacea, 21
Alsine Curtisii; A. Jamesiana
Sorosporium Saponariae, 1007
Alsine nitens; A. praecox
Ustilago Alsineae, 991
Ambrosia artemisiifolia
Entyloma compositarum, 62, 1020
Entyloma polysporum, 62, 1021
Ambrosia bidentata
Entyloma polysporum, 62
Ambrosia psilostachya
Entyloma compositarum, 62
Ambrosia trifida
Entyloma compositarum, 62, 1020
Entyloma polysporum, 62, 1021
Ammophila arenaria
Ustilago striaeformis, 18
Ammophila arundinacea, see **A. arenaria**
Andropogon argenteus, see **A. ternarius**
Andropogon argyreus, see **A. ternarius**

Andropogon barbinodis (*A. saccharoides* var. *leucopogon*)
Sphacelotheca Andropogonis-hirtifolii, 999
Sphacelotheca Ischaemi, 27, 996
Tolyposporella Brunkii, 43
Andropogon bicornis
Sphacelotheca culmiperda, 997
Tolyposporella Brunkii, 1009
Andropogon brachystachys
Sorosporium Everhartii, 1006
Andropogon contortus, see **Heteropogon contortus**
Andropogon Elliottii
Sorosporium Ellisii, 1006
Andropogon furcatus
Sorosporium Everhartii, 1006
Sorosporium provinciale, 39, 1007
Sphacelotheca Ischaemi, 27, 996
Sphacelotheca occidentalis, 27, 995
Andropogon glomeratus
Sorosporium Ellisii, 1006
Sorosporium Everhartii, 38
Sphacelotheca monilifera, 994
Sphacelotheca occidentalis, 27
Andropogon Hallii
Sphacelotheca occidentalis, 27, 995
Andropogon hirtifolius var. **pubiflorus**
Sphacelotheca Andropogonis-hirtifolii, 28
Tolyposporella Brunkii, 43
Andropogon leucostachys
Sphacelotheca Kellermanii, 997
Andropogon macrourus, see **A. glomeratus**
Andropogon perforatus
Tolyposporella Brunkii, 43
Andropogon pertusus var. **panormitanus**
Sphacelotheca Ischaemi, 996
Andropogon provincialis, see **A. furcatus**
Andropogon saccharoides
Sphacelotheca Andropogonis-hirtifolii, 28
Sphacelotheca Ischaemi, 27, 996
Tolyposporella Brunkii, 43
Andropogon saccharoides var. **leucopogon**, see **A. barbinodis**
Andropogon scoparius, see **Schizachyrium scoparium**
Andropogon ternarius (*A. argyreus*)
Sorosporium Everhartii, 1006
Sphacelotheca Seymouriana, 994
Tolyposporella Brunkii, 43
Andropogon Torreyanus, see **A. saccharoides**
Andropogon virginicus
Sorosporium Ellisii, 39, 1006
Sorosporium Everhartii, 38, 1006
Sphacelotheca Seymouriana, 25
Anemone canadensis; A. caroliniana; A. decapetala
Urocystis Anemones, 55
Anemone narcissiflora
Urocystis sorosporioides, 1014
Anemone nemorosa, see **A. quinquefolia**
Anemone patens var. **Nuttalliana**, see **Pulsatilla ludoviciana**
Anemone patens var. **Wolfgangiana**, see **Pulsatilla ludoviciana**
Anemone pennsylvanica, see **A. canadensis**
Anemone quinquefolia
Entyloma Ranunculi, 61
Urocystis Anemones, 55, 1014
Anemone virginiana
Urocystis Anemones, 55, 1014
Anemonella, see **Syndesmon**
Anthoxanthum odoratum
Tilletia Anthoxanthi, 48, 1011
Anticlea elegans
Urocystis Flowersii, 1016
Aquilegia caerulea; A. flavescens; A. leptocera
Urocystis sorosporioides, 56, 1014
Arenaria groenlandica
Ustilago violacea, 21
Arenaria lateriflora, see **Moehringia lateriflora**
Aristida arizonica; A. basiramea
Sorosporium consanguineum, 37
Aristida dichotoma
Sorosporium confusum, 1006
Sorosporium Ellisii, 39
Aristida glauca
Sorosporium consanguineum, 1005
Aristida gracilis, see **A. longespica**
Aristida longespica
Sorosporium confusum, 1006
Aristida longiseta; A. longiseta var. **robusta; A. Orcuttiana**
Sorosporium consanguineum, 37, 1005
Aristida purpurascens
Sorosporium confusum, 1006
Sorosporium consanguineum, 37
Aristida purpurea, see **A. longiseta**
Aristida "Rusbyi," see **A. arizonica**
Aristida Schiedeana, see **A. Orcuttiana**
Arnica Chamissonis; A. cordifolia; A. fulgens; A. latifolia; A. subplumosa
Entyloma arnicale, 63, 1022
Arrhenatherum avenaceum, see **A. elatius**
Arrhenatherum elatius
Ustilago perennans, 7, 980
Aster adscendens; A. cordifolius; A. Novi-Belgii; A. paniculatus; A. puniceus
Entyloma compositarum, 62, 1020
Astragalus bisulcatus; A. Chamaeleuce; A. Drummondii; A. missouriensis; A. mollissimus; A. Mortoni
Thecaphora deformans, 41, 1008
Astragalus multiflorus, see **Homalobus tenellus**
Astragalus Nuttallianus; A. scopulorum; A. Thompsonae; A. Wootoni
Thecaphora deformans, 41, 1008
Atheropogon curtipendulus
Ustilago Hieronymi, 13, 985
Atragene occidentalis
Urocystis carcinodes, 55

Avena barbata
Ustilago Avenae, 980
Avena fatua
Ustilago Avenae, 7, 980
Ustilago levis, 980
Avena fatua var. **glabrata**; **A. nuda** var. **elegantissima**
Ustilago levis, 980
Avena orientalis; **A. sativa**
Ustilago Avenae, 7, 980
Ustilago levis, 7, 980
Beckmannia erucaeformis, see **B. Syzigachne**
Beckmannia Syzigachne
Ustilago striaeformis, 989
Beckwithia Andersonii
Urocystis sorosporioides, 1014
Bidens chrysanthemoides, see **B. laevis**
Bidens frondosa
Entyloma guaraniticum, 63
Bidens laevis
Entyloma compositarum, 62, 1020
Bidens leucantha
Entyloma guaraniticum, 63
Thecaphora pustulata, 1007
Bidens pilosa
Entyloma guaraniticum, 1023
Bidens tenuisecta; **B. vulgata**
Entyloma compositarum, 1020
Bigelovia coronopifolia, see **Isocoma coronopifolia**
Bigelovia veneta, see **Isocoma veneta**
Bilderdykia cilinodis (*Tiniaria cilinodis*); **B. Convolvulus** (*Tiniaria Convolvulus*); **B. dumetorum** (*Tiniaria dumetorum*); **B. scandens** (*Tiniaria scandens*)
Ustilago anomala, 22, 992
Bistorta bistortoides
Sphacelotheca borealis, 30 (as S. Hydropiperis var. borealis), 999
Sphacelotheca inflorescentiae, 999
Ustilago Bistortarum, 24
Bistorta vivipara
Sphacelotheca Hydropiperis, 999
Sphacelotheca inflorescentiae, 24 (as Ustilago Bistortarum var. inflorescentiae), 999
Ustilago Bistortarum, 24
Boerhaavia sp.
Thecaphora tunicata, 42
Bolelia elegans, see **Downingia elegans**
Boltonia asteroides
Entyloma compositarum, 1020
Bouteloua aristidoides, see **Triathera aristidoides**
Bouteloua barbata (*B. polystachya*)
Ustilago Hieronymi, 13
Bouteloua breviseta
Ustilago calcara, 6
Ustilago Hieronymi, 13
Bouteloua bromoides, see **B. radicosa**
Bouteloua chondrosioides (*B. Havardii*)
Ustilago Hieronymi, 13
Bouteloua curtipendula, see **Atheropogon curtipendulus**
Bouteloua eriopoda
Ustilago Hieronymi, 13, 985
Bouteloua gracilis (*B. oligostachya*)
Ustilago Boutelouae, 13, 984
Ustilago Hieronymi, 13, 985
Ustilago pseudohieronymi, 985
Bouteloua Havardii, see **B. chondrosioides**
Bouteloua heterostega
Ustilago Hieronymi, 985
Bouteloua hirsuta
Ustilago Boutelouae, 984
Ustilago minor, 13
Bouteloua oligostachya, see **B. gracilis**
Bouteloua polystachya, see **B. barbata**
Bouteloua procumbens, see **B. simplex**
Bouteloua prostrata, see **B. simplex**
Bouteloua racemosa, see **Atheropogon curtipendulus**
Bouteloua radicosa (*B. bromoides*)
Ustilago Hieronymi, 13
Bouteloua simplex
Ustilago Boutelouae, 984
Brachiaria Meziana
Sphacelotheca diplospora var. verruculosa, 994
Bromus arvensis; **B. breviaristatus**; **B. carinatus** (*B. Hookerianus*); **B. catharticus**
Ustilago bromivora, 10, 983
Bromus ciliatus
Urocystis Agropyri, 58
Ustilago bromivora, 10, 983
Ustilago bromivora var. macrospora, 10
Bromus commutatus; **B. commutatus** var. **apricorum**
Ustilago bromivora, 983
Bromus Hookerianus, see **B. carinatus**
Bromus hordeaceus, see **B. mollis**
Bromus hordeaceus var. **glabrescens**, see **B. racemosus**
Bromus inermis
Ustilago macrospora, 989
Bromus japonicus; **B. Kalmii**
Ustilago bromivora, 10, 983
Bromus marginatus
Urocystis Agropyri, 1017
Ustilago bromivora, 10, 983
Bromus marginatus var. **latior**
Ustilago bromivora, 983
Bromus mollis
Tilletia Guyotiana, 1011
Ustilago bromivora, 10, 983
Bromus polyanthus; **B. Pumpellianus**
Ustilago bromivora, 10, 983
Bromus racemosus
Tilletia Guyotiana, 1011
Ustilago bromivora, 10
Bromus Richardsoni, see **B. ciliatus**

Bromus rigidus
Ustilago bromivora, 983
Bromus secalinus
Ustilago bromivora, 10, 983
Ustilago striaeformis, 989
Bromus secalinus var. **velutinus; B. sterilis; B. tectorum; B. Trinii**
Ustilago bromivora, 983
Bromus unioloides, see **B. catharticus**
Bromus villosus, see **B. rigidus**
Bromus vulgaris
Ustilago bromivora, 10, 983
Browallia demissa
Entyloma Browalliae, 1025
Buchloë dactyloides
Tilletia buchloeana, 51, 1013
Ustilago Buchloes, 14, 985
Bulbilis dactyloides, see **Buchloë dactyloides**
Calamagrostis breviseta, see **C. Pickeringii**
Calamagrostis canadensis
Urocystis Agropyri, 58
Ustilago Calamagrostidis, 19, 989
Calamagrostis Pickeringii
Ustilago Calamagrostidis, 19
Calandrinia Breweri; C. Menziesii
Ustilago Calandriniae, 22
Calandrinia nevadensis, see **Oreobroma nevadense**
Calendula officinalis
Entyloma Calendulae, 1022
Callitriche marginata var. **longipedunculata**
Doassansia Callitriches, 1027
Camassia esculenta, see **C. Quamash**
Camassia Fraseri, see **C. scilloides**
Camassia Quamash; C. scilloides
Urocystis Colchici, 1016
Carduus Centaureae, see **Cirsium Centaureae**
Carduus leiocephalus, see **Cirsium leiocephalum**
Carduus ochrocentrus, see **Cirsium ochrocentrum**
Carex abacta, see **C. Michauxiana**
Carex acuta (*C. Goodenowii*)
Cintractia Caricis, 33, 1001
Carex adusta
Thecaphora aterrima, 43
Carex altocaulis, see **C. saltuensis**
Carex angustior (*C. echinata* var. *microstachys*)
Cintractia Caricis, 33, 1001
Carex aquatilis (*C. variabilis*)
Cintractia Caricis, 33, 1001
Schizonella melanogramma, 1005
Carex arctata; Carex artitecta (*C. varia*)
Cintractia Caricis, 33, 1001
Carex atherodes
Cintractia Caricis, 1001
Cintractia subinclusa, 1001
Urocystis Fischeri, 1018
Carex atrata
Cintractia Caricis, 1001
Carex atratiformis
Schizonella melanogramma, 36
Carex aurea
Cintractia Caricis, 1001
Carex Bigelovii, see **C. concolor**
Carex bipartita (*C. lagopina*); **C. blanda; C. Buxbaumii; C. canescens**
Cintractia Caricis, 33, 1001
Carex cephalantha (*C. sterilis* var. *cephalantha*)
Cintractia Caricis, 33
Carex cladostachya, see **C. polystachya**
Carex communis
Schizonella melanogramma, 1005
Carex concolor (*C. Bigelovii, C. rigida*)
Cintractia Caricis, 33, 1001
Entyloma caricinum, 61
Carex convoluta
Schizonella melanogramma, 1005
Carex crinita; C. deflexa; C. diandra
Cintractia Caricis, 33, 1001
Carex dioica, see **C. gynocrates**
Carex Douglasii
Cintractia Caricis, 33, 1001
Carex echinata, see **C. muricata**
Carex echinata var. **cephalantha**, see **C. cephalantha**
Carex echinata var. **microstachys**, see **C. angustior**
Carex elynoides; C. exilis
Cintractia Caricis, 33
Carex festiva, see **C. festivella**
Carex festivella (*C. festiva*)
Cintractia Caricis, 33
Carex filifolia
Cintractia Caricis, 33, 1001
Cintractia externa, 34, 1002
Carex filiformis, see **C. lasiocarpa**
Carex folliculata var. **australis**, see **C. lonchocarpa**
Carex fusca, see **C. Buxbaumii**
Carex Geyeri; C. glareosa; C. Gmelini
Cintractia Caricis, 33, 1001
Carex Goodenowii, see **C. acuta**
Carex gynocrates (*C. Redowskyana*); **C. heliophila**
Cintractia Caricis, 33, 1001
Carex Hoodii
Schizonella melanogramma, 36
Carex incurva; C. interior
Cintractia Caricis, 33, 1001
Carex invisa, see **C. spectabilis**
Carex laeviconica (*C. trichocarpa* var. *Deweyi*)
Cintractia subinclusa, 33
Carex lagopina, see **C. bipartita**
Carex lanceata (*C. salina*)
Cintractia Caricis, 33, 1001
Carex lanuginosa
Cintractia subinclusa, 32, 1001
Carex lasiocarpa
Cintractia Caricis, 1001

Carex laxiflora
Schizonella melanogramma, 36, 1005
Carex laxiflora var. **blanda**, see **C. blanda**
Carex Leersii var. **angustata**, see **C. angustior**
Carex leptalea; **C. limosa**; **C. livida**
Cintractia Caricis, 33, 1001
Carex lonchocarpa (*C. folliculata* var. *australis*)
Cintractia Caricis, 33
Farysia olivacea, 993
Carex longirostris
Schizonella melanogramma, 1005
Carex lupulina
Cintractia subinclusa, 32
Carex luzulaefolia
Cintractia Caricis, 33
Carex magellanica, see **C. paupercula**
Carex marcida, see **C. praegracilis**
Carex Michauxiana
Cintractia subinclusa, 32
Carex monile, see **C. vesicaria** var. **monile**
Carex muricata; **C. nardina**
Cintractia Caricis, 33, 1001
Carex nebraskensis
Cintractia Caricis, 1001
Schizonella melanogramma, 1005
Carex nigricans; **C. obnupta**; **C. obtusata**; **C. occidentalis**
Cintractia Caricis, 33, 1001
Carex oligosperma
Cintractia Caricis, 33
Cintractia subinclusa, 32
Carex paupercula (*C. magellanica*); **C. pedunculata**
Cintractia Caricis, 33, 1001
Carex pennsylvanica
Cintractia Caricis, 33, 1001
Schizonella melanogramma, 36, 1005
Thecaphora aterrima, 43
Carex picta
Schizonella melanogramma, 1005
Carex polygama, see **C. Buxbaumii**
Carex polystachya
Farysia olivacea, 993
Carex praegracilis (*C. marcida*)
Cintractia Caricis, 33
Carex Pseudo-Cyperus
Farysia olivacea, 993
Carex pseudoscirpoidea
Cintractia Caricis, 33
Carex Redowskyana, see **C. gynocrates**
Carex rigida, see **C. concolor**
Carex rostrata (*C. utriculata*)
Cintractia Caricis, 33, 1001
Cintractia subinclusa, 32
Farysia olivacea, 993
Carex rupestris
Cintractia Caricis, 33
Carex salina, see **C. lanceata**
Carex saltuensis (*C. altocaulis*)
Cintractia Caricis, 33
Carex scirpoidea; **C. siccata**; **C. sitchensis**; **C. spectabilis** (*C. invisa*)
Cintractia Caricis, 33
Carex stans, see **C. aquatilis**
Carex stenophylla
Cintractia Caricis, 1001
Cintractia subinclusa, 1001
Carex sterilis var. **cephalantha**, see **C. cephalantha**
Carex straminiformis; **C. stricta**; **C. stricta** var. **angustata**; **C. substricta**
Cintractia Caricis, 33, 1001
Carex tetanica
Cintractia Caricis, 33, 1001
Schizonella melanogramma, 1005
Carex trichocarpa var. **Deweyi**, see **C. laeviconica**
Carex triquetra
Urocystis Fischeri, 1018
Carex turfosa, see **C. acuta**
Carex turgescens
Farysia olivacea, 993
Carex umbellata
Cintractia Caricis, 33, 1001
Carex utriculata, see **C. rostrata**
Carex vaginata, see **C. saltuensis**
Carex varia, see **C. artitecta**
Carex variabilis, see **C. aquatilis**
Carex vesicaria var. **monile** (*C. monile*)
Cintractia Caricis, 33
Cintractia subinclusa, 1001
Carex vulgaris var. **hyperborea**, see **C. concolor**
Carex sp.
Cintractia arctica, 1001
Castalia odorata; **C. tuberosa**
Entyloma Nymphaeae, 66, 1025
Catabrosa aquatica
Entyloma crastophilum, 60
Cathestechum prostratum
Tilletia Cathesteci, 51
Cenchrus carolinianus, see **C. incertus**
Cenchrus echinatus; **C. incertus**; **C. multiflorus**; **C. pallidus**; **C. pauciflorus**; **C. tribuloides**
Sorosporium Syntherismae, 38, 1006
Cerastium arvense
Sorosporium Saponariae, 1007
Cerastium maximum
Ustilago violacea, 21
Cerastium occidentale; **C. oreophilum**
Sorosporium Saponariae, 1007
Cerastium viscosum
Ustilago Duriaeana, 991
Chaetochloa geniculata (*C. imberbis*)
Sphacelotheca pamparum, 27, 995
Chaetochloa glauca, see **C. lutescens**
Chaetochloa imberbis, see **C. geniculata**
Chaetochloa italica
Ustilago Crameri, 10, 983
Chaetochloa lutescens (*C. glauca*)
Ustilago neglecta, 16, 987

Chloris barbata, see **C. paraguayensis**
Chloris elegans, see **C. virgata**
Chloris paraguayensis
Tilletia chloridicola, 1013
Chloris radiata
Ustilago chloridicola, 984
Chloris submutica
Ustilago Ulei, 11
Chloris verticillata
Ustilago chloridicola, 984
Chloris virgata (*C. elegans*)
Ustilago elegans, 18
Chrysopogon avenaceus, see **Sorghastrum avenaceum**
Chrysopogon nutans, see **Sorghastrum nutans**
Chrysopsis arida, see **C. asprella**
Chrysopsis asprella; **C. villosa**
Entyloma compositarum, 1020
Cimicifuga racemosa
Urocystis carcinodes, 55, 1014
Circaea alpina
Entyloma Circaeae, 1022
Cirsium Centaureae; **C. leiocephalum** (*Carduus leiocephalus*); **C. ochrocentrum** (*Carduus ochrocentrus*)
Thecaphora Trailii, 41, 1008
Cissus acida; **C. erosa**; **C. sicyoides**; **C. trifoliata**
Mykosyrinx Cissi, 36, 1005
Cladium jamaicense, see **Mariscus jamaicensis**
Cladothrix lanuginosa, see **Tidestromia lanuginosa**
Claytonia linearis
Ustilago Claytoniae, 991
Cnicus ochrocentrus, see **Cirsium ochrocentrum**
Coix Lacryma-Jobi
Ustilago Coicis, 984
Colchicum autumnale
Urocystis Colchici, 1016
Collinsia bartsiaefolia; **C. grandiflora**; **C. tenella**
Entyloma Collinsiae, 63, 1023
Cosmos sulphureus
Entyloma Holwayi, 62
Cymbopogon sp.
Sphacelotheca panamensis, 995
Cynodon Dactylon
Ustilago Cynodontis, 981
Cyperus cylindricus; **C. filiculmis**
Cintractia Cyperi, 32, 1001
Cyperus Grayii
Cintractia Cyperi, 1001
Cintractia minor, 35 (as C. axicola var. minor), 1003
Cyperus ligularis
Cintractia limitata, 32
Cintractia minor, 1003
Cyperus rotundus; **C. sphacelatus**
Cintractia minor, 35 (as C. axicola var. minor), 1003
Cyrtorhyncha ranunculina
Urocystis Anemones, 55
Dactylis glomerata
Ustilago striaeformis, 989
Dactyloctenium aegyptium
Ustilago sparsa, 12
Dahlia coccinea; **D. variabilis**
Entyloma Dahliae, 1022
Danthonia americana; **D. californica**; **D. compressa**; **D. intermedia**; **D. spicata**; **D. unispicata**
Ustilago residua, 9, 981
Dasyochloa pulchella
Ustilago Hieronymi, 13
Delphinium decorum; **D. scopulorum**; **D. tricorne**
Urocystis sorosporioides, 56, 1014
Dendromecon sp.
Entyloma Eschscholtziae, 65
Deschampsia caespitosa
Tilletia Airae, 1011
Deschampsia calycina, see **D. danthonioides**
Deschampsia danthonioides (*D. calycina*); **D. elongata**
Tilletia Airae, 49, 1011
Descurainia andrenarum
Urocystis coralloides, 1019
Desmodium acuminatum, see **D. glutinosum**
Desmodium glutinosum (*D. acuminatum*, *Meibomia grandiflora*); **D. nudiflorum** (*Meibomia nudiflora*)
Thecaphora deformans, 41
Dianthus Caryophyllus
Ustilago violacea, 991
Digitaria filiformis, see **Syntherisma filiforme**
Digitaria fimbriata, see **Syntherisma sanguinale**
Digitaria glabra, see **Syntherisma Ischaemum**
Digitaria humifusa, see **Syntherisma Ischaemum**
Digitaria sanguinalis, see **Syntherisma sanguinale**
Distichlis maritima, see **D. spicata**
Distichlis spicata
Ustilago hypodytes, 5, 978
Downingia elegans
Doassansia Downingiae, 1026
Echinochloa colona
Ustilago sphaerogena, 14
Echinochloa Crus-galli
Sphacelotheca diplospora, 26
Tolyposporium bullatum, 44, 1010
Ustilago Crus-galli, 14, 986
Ustilago sphaerogena, 14, 986
Echinochloa frumentacea
Tolyposporium bullatum, 1010
Ustilago Crus-galli, 986
Echinochloa Walteri
Tolyposporium bullatum, 1010
Ustilago Crus-galli, 14
Ustilago sphaerogena, 14, 986
Echinochloa zelayensis
Ustilago Crus-galli, 986

Echinodorus cordifolius
Burrillia Echinodori, 67, 1026
Echinodorus rostratus, see **E. cordifolius**
Eichhornia crassipes
Doassansia Eichhorniae, 1028
Eichhornia speciosa, see **E. crassipes**
Eleocharis acicularis
Entyloma parvum, 1020
Elymus arenarius, see **E. mollis**
Elymus canadensis
Urocystis Agropyri, 58, 1017
Ustilago hypodytes, 5
Ustilago macrospora, 989
Ustilago striaeformis, 989
Elymus canadensis var. **glaucifolius**
Ustilago striaeformis, 18, 989
Elymus condensatus
Urocystis Agropyri, 1017
Ustilago hypodytes, 5, 978
Elymus glaucus
Tilletia Elymi, 48, 1011
Urocystis Agropyri, 1017
Ustilago hypodytes, 5
Ustilago macrospora, 989
Ustilago striaeformis, 989
Elymus Macounii
Ustilago Lorentziana, 982
Ustilago striaeformis, 989
Elymus mollis (*E. arenarius*)
Urocystis Agropyri, 58, 1017
Elymus robustus
Urocystis Agropyri, 58
Ustilago macrospora, 989
Ustilago striaeformis, 18
Elymus striatus
Urocystis Agropyri, 1017
Ustilago hypodytes, 5
Ustilago striaeformis, 989
Elymus triticoides
Ustilago hypodytes, 978
Ustilago striaeformis, 989
Elymus virginicus
Urocystis Agropyri, 58, 1017
Ustilago striaeformis, 18, 989
Elymus virginicus var. **hirsutiglumis**, see **E. virginicus** var. **intermedius**
Elymus virginicus var. **intermedius**
Ustilago macrospora, 989
Elyna Bellardi, see **Kobresia Bellardi**
Epilobium alpinum
Doassansia Epilobii, 68
Eragrostis cilianensis (*E. major*)
Ustilago spermophora, 12, 984
Eragrostis diffusa
Sphacelotheca strangulans, 999
Eragrostis glomerata
Tilletia Eragrostidis, 53
Eragrostis hypnoides
Ustilago spermophora, 12
Eragrostis major, see **E. cilianensis**
Eragrostis minor
Ustilago spermophora, 984
Eragrostis neo-mexicana
Sphacelotheca strangulans, 29
Erigeron Coulteri; **E. elatus**; **E. glabellus**; **E. macranthus**; **E. philadelphicus**; **E. salsuginosus**
Entyloma compositarum, 62, 1020
Erigeron spathulatus
Entyloma occultum, 1025
Erigeron subtrinervis
Entyloma compositarum, 1020
Eriocaulon septangulare
Tolyposporium Eriocauli, 45
Ustilago Eriocauli, 16
Eriochloa punctata, see **Monachne punctata**
Eriocoma cuspidata, see **E. hymenoides**
Eriocoma hymenoides (*E. cuspidata*)
Ustilago hypodytes, 5, 978
Ustilago minima, 5, 978
Eryngium aquaticum
Entyloma Eryngii, 65
Eryngium yuccifolium, see **E. aquaticum**
Erythronium albidum
Ustilago Heufleri, 990
Erythronium americanum
Urocystis Erythronii, 1015
Ustilago Heufleri, 20, 990
Eschscholtzia californica
Entyloma Eschscholtziae, 65
Euchlaena luxurians, see **E. mexicana**
Euchlaena mexicana (*E. luxurians*)
Ustilago Kellermanii, 15, 987
Ustilago Zeae, 15, 987
Eupatorium ageratoides, see **E. urticaefolium**
Eupatorium urticaefolium (*E. ageratoides*)
Entyloma compositarum, 62, 1020
Festuca amplissima
Ustilago sphaerocarpa, 988
Festuca confinis, see **F. Kingii**
Festuca elatior
Ustilago striaeformis, 989
Festuca Kingii
Urocystis Agropyri, 1017
Ustilago hypodytes, 978
Festuca microstachya
Tilletia fusca, 49
Ustilago Mulfordiana, 18
Festuca nutans, see **F. obtusa**
Festuca obtusa (*F. nutans*)
Ustilago striaeformis, 18, 989
Festuca octoflora
Tilletia fusca, 49
Ustilago Mulfordiana, 18, 988
Festuca ovina
Ustilago striaeformis, 989
Festuca pacifica
Tilletia fusca, 1011
Festuca rubra
Urocystis Agropyri, 1017

Festuca saximontana
Ustilago striaeformis, 989
Festuca tenella, see **F. octoflora**
Fimbristylis autumnalis; F. complanata; F. diphylla; F. ferruginea
Cintractia axicola, 35, 1003
Fimbristylis Holwayana
Cintractia axicola, 35
Cintractia Clintonii, 1003
Fimbristylis puberula
Cintractia axicola, 1003
Fimbristylis spadicea, see **F. puberula**
Fimbristylis Vahlii
Cintractia axicola, 1003
Floerkea proserpinacoides
Entyloma Floerkeae, 63, 1023
Fluminea festucacea (*Scolochloa festucacea*)
Ustilago Arthurii, 20, 990
Gaillardia aristata; G. pulchella
Entyloma polysporum, 62, 1021
Gayophytum caesium; G. intermedium; G. lasiospermum; G. ramosissimum
Ustilago Gayophyti, 21, 991
Geum ciliatum, see **Sieversia ciliata**
Gilia sp.
Urocystis Giliae, 1018
Gladiolus sp.
Urocystis Gladioli, 1016
Glyceria canadensis; G. fluitans
Ustilago Davisii, 6 (as U. longissima var. macrospora), 979
Glyceria grandis
Ustilago Arthurii, 20
Ustilago longissima, 6, 979
Glyceria laxa
Ustilago Davisii, 6 (as U. longissima var. macrospora)
Glyceria nervata, see **G. striata**
Glyceria obtusa
Ustilago longissima, 979
Glyceria pallida
Entyloma crastophilum, 1019
Glyceria striata
Urocystis Agropyri, 1017
Ustilago longissima, 979
Gnaphalium sp.
Entyloma compositarum, 62
Gratiola virginiana
Entyloma Gratiolae, 1025
Grindelia inornata; G. robusta
Thecaphora californica, 41, 1008
Grindelia squarrosa
Thecaphora californica, 1008
Thecaphora cuneata, 41, 1008
Guardiola platyphylla
Thecaphora mexicana, 42
Hackelochloa granularis
Sphacelotheca erythraeensis, 996
Helenium autumnale
Entyloma compositarum, 62
Entyloma polysporum, 1021
Helianthus annuus
Entyloma polysporum, 62
Hepatica acuta
Urocystis Anemones, 55, 1014
Hepatica acutiloba, see **H. acuta**
Hepatica americana
Urocystis Anemones, 55, 1014
Hepatica Hepatica, see **H. americana**
Hepatica triloba, see **H. americana**
Heteropogon acuminatus, see **H. melanocarpus**
Heteropogon contortus
Sorosporium contortum, 38, 1006
Sphacelotheca Ischaemi, 27
Sphacelotheca monilifera, 26
Heteropogon melanocarpus
Sphacelotheca Nealii, 26
Heterotheca Lamarckii, see **H. subaxillaris**
Heterotheca subaxillaris
Entyloma compositarum, 62
Heuchera parvifolia
Urocystis Lithophragmae, 1015
Hilaria cenchroides
Ustilago Aegopogonis, 17
Ustilago affinis, 9
Hilaria Jamesii
Ustilago Hilariae, 18
Ustilago hypodytes, 978
Hilaria mutica
Ustilago Hilariae, 18, 988
Holcus lanatus
Entyloma crastophilum, 60
Tilletia Holci, 1011
Ustilago striaeformis, 989
Homalobus tenellus
Thecaphora deformans, 41
Homalocenchrus hexandrus, see **Leersia hexandra**
Homalocenchrus lenticularis, see **Leersia lenticularis**
Homalocenchrus oryzoides, see **Leersia oryzoides**
Homalocenchrus virginicus, see **Leersia virginica**
Hordeum caespitosum
Ustilago Lorentziana, 9, 982
Hordeum distichon
Ustilago Hordei, 979
Hordeum jubatum
Ustilago Lorentziana, 9, 982
Ustilago striaeformis, 989
Hordeum marinum (*H. maritimum*)
Ustilago Lorentziana, 9
Hordeum maritimum, see **H. marinum**
Hordeum murinum
Ustilago Lorentziana, 9, 982
Hordeum nodosum
Tilletia texana, 51
Urocystis Agropyri, 1017
Ustilago Lorentziana, 9, 982
Hordeum pratense, see **H. nodosum**
Hordeum pusillum
Tilletia texana, 1012
Ustilago Lorentziana, 9, 982

Hordeum sativum, see **H. vulgare**
Hordeum vulgare
Ustilago Hordei, 979
Ustilago nuda, 8, 980
Hordeum vulgare var. **trifurcatum**
Ustilago Hordei, 979
Hosackia parviflora, see **Lotus micranthus**
Hypoxis domingensis
Urocystis Hypoxyis, 1018
Hypoxis erecta, see **H. hirsuta**
Hypoxis hirsuta
Urocystis Hypoxyis, 59
Hystrix Hystrix, see **H. patula**
Hystrix patula
Ustilago striaeformis, 989
Iresine Celosia
Thecaphora Haumani, 1008
Thecaphora Iresine, 1008
Iresine paniculata, see **I. Celosia**
Isocoma coronopifolia; **I. veneta**
Thecaphora pilulaeformis, 40, 1007
Juncoides campestre, see **Luzula campestris**
Juncoides glabratum, see **Luzula glabrata**
Juncus acuminatus
Cintractia Junci, 34
Juncus balticus
Urocystis Junci, 58
Juncus bufonius
Cintractia Junci, 1002
Tolyposporium Junci, 1010
Juncus diffusissimus; **J. Dudleyi**; **J. effusus**; **J. tenuis**
Cintractia Junci, β4, 1002
Kobresia Bellardi (*Elyna Bellardi*)
Cintractia Caricis, 33, 1001
Kobresia bipartita, see **K. simpliciuscula**
Kobresia caricina, see **K. simpliciuscula**
Kobresia scirpina, see **K. Bellardi**
Kobresia simpliciuscula (*K. bipartita*)
Cintractia Caricis, 33
Koeleria cristata
Urocystis Agropyri, 1017
Koenigia islandica, see **Macounastrum islandicum**
Lactuca canadensis
Entyloma compositarum, 62
Lappula floribunda
Entyloma serotinum, 1024
Lathyrus utahensis
Thecaphora deformans, 1008
Leersia hexandra
Tolyposporium globuligerum, 44
Leersia lenticularis; **L. oryzoides**; **L. virginica**
Tilletia corona, 52, 1013
Lepachys columnaris, see **L. columnifera**
Lepachys columnifera
Entyloma polysporum, 1020
Lepachys pinnata
Entyloma compositarum, 62, 1020
Leptochloa filiformis (*L. mucronata*)
Ustilago heterogena, 986
Ustilago ornata, 16
Leptochloa imbricata, see **L. uninervia**
Leptochloa mucronata, see **L. filiformis**
Leptochloa scabra
Ustilago heterogena, 15
Leptochloa uninervia
Ustilago ornata, 987
Leptochloa viscida
Ustilago heterogena, 986
Lewisia nevadensis, see **Oreobroma nevadense**
Limnanthemum Humboldtianum
Burrillia Limnanthemi, 1026
Limnanthemum lacunosum
Burrillia decipiens, 67, 1026
Limnocharis flava
Doassansia Limnocharidis, 1028
Linaria Linaria, see **Linaria vulgaris**
Linaria vulgaris
Entyloma Linariae, 65, 1024
Lithophragma bulbifera
Urocystis Lithophragmae, 56
Lobelia Cliffortiana; **L. inflata**; **L. spicata**
Entyloma Lobeliae, 64, 1023
Lolium perenne
Ustilago striaeformis, 989
Lolium temulentum
Ustilago Lolii, 981
Lophotocarpus calycinus
Doassansia Sagittariae, 1027
Lotus humistratus; **L. micranthus**
Thecaphora deformans, 41
Lupinus sp.
Thecaphora deformans, 41
Luzula campestris
Cintractia Luzulae, 34
Luzula glabrata
Ustilago Vuijckii, 990
Lychnis sp.
Ustilago violacea, 21
Lycurus phleoides
Ustilago lycuroides, 10
Macounastrum islandicum
Ustilago Koenigiae, 23
Madia glomerata
Entyloma compositarum, 1020
Manisuris granularis, see **Hackelochloa granularis**
Mariscus jamaicensis
Cintractia utriculicola, 1003
Meibomia grandiflora, see **Desmodium glutinosum**
Meibomia nudiflora, see **Desmodium nudiflorum**
Melica bella, see **M. bulbosa**
Melica bulbosa
Ustilago hypodytes, 978
Melica imperfecta
Urocystis Agropyri, 1017

Melilotus indica
Entyloma Meliloti, 1020
Menispermum canadense
Entyloma Menispermi, 61, 1020
Mertensia virginica
Entyloma serotinum, 64, 1024
Microchloa indica
Ustilago Griffithsii, 988
Microchloa setacea, see **M. indica**
Mimulus floribundus
Entyloma Clintonianum, 1024
Moehringia lateriflora
Ustilago violacea, 21, 991
Monachne punctata
Sorosporium Eriochloe, 38
Muhlenbergia arenacea
Tilletia asperifolia, 1012
Muhlenbergia asperifolia (*Sporobolus asperifolius*)
Entyloma crastophilum, 1019
Tilletia asperifolia, 50, 1012
Muhlenbergia filiformis (*Sporobolus gracillimus, S. simplex*)
Tilletia montana, 49
Muhlenbergia glomerata, see **M. racemosa**
Muhlenbergia gracillima
Ustilago pseudohieronymi, 985
Muhlenbergia mexicana
Entyloma crastophilum, 1019
Muhlenbergia montana
Ustilago Bethelii, 985
Muhlenbergia paucifiora (*M. Pringlei*); **M. Porteri**
Ustilago Muhlenbergiae, 8
Muhlenbergia Pringlei, see **M. paucifiora**
Muhlenbergia racemosa
Sphacelotheca montaniensis, 29, 999
Muhlenbergia Schaffneri var. **elongata**
Tilletia Muhlenbergiae, 49
Muhlenbergia squarrosa
Ustilago pseudohieronymi, 985
Muhlenbergia texana, see **M. Porteri**
Muhlenbergia sp.
Ustilago mexicana, 6
Muscari comosa
Ustilago Vaillantii, 990
Nolina microcarpa; N. texana
Tolyposporella Nolinae, 44, 1009
Nuphar advena, see **Nymphaea advena**
Nymphaea advena
Entyloma Nymphaeae, 66, 1025
Nymphaea odorata, see **Castalia odorata**
Nymphaea reniformis, see **Castalia tuberosa**
Burrillia decipiens, 67, 1026
Oreobroma nevadense
Ustilago Calandriniae, 992
Oryza sativa
Entyloma lineatum, 1019
Tilletia horrida, 52, 1013
Oryzopsis cuspidata, see **Eriocoma hymenoides**
Oxalis corniculata; O. stricta
Ustilago Oxalidis, 20, 990
Oxyria digyna
Ustilago vinosa, 21
Panicularia americana, see **Glyceria grandis**
Panicularia canadensis, see **Glyceria canadensis**
Panicularia fluitans, see **Glyceria fluitans**
Panicularia laxa, see **Glyceria laxa**
Panicularia nervata, see **Glyceria striata**
Panicularia obtusa, see **Glyceria obtusa**
Panicum agrostoides
Sorosporium Syntherismae, 38
Panicum caespitosum, see **P. reptans**
Panicum capillare
Sorosporium Syntherismae, 38, 1006
Tilletia pulcherrima, 1013
Panicum colonum, see **Echinochloa colona**
Panicum Crus-galli, see **Echinochloa Crus-galli**
Panicum dichotomiflorum (*P. proliferum*)
Entyloma speciosum, 60, 1020
Sorosporium Syntherismae, 38, 1006
Ustilago Panici-proliferi, 11
Ustilago togata, 14 (as U. pustulata), 986
Panicum filiforme, see **Syntherisma filiforme**
Panicum fimbriatum, see **Syntherisma fimbriatum**
Panicum geminatum (*P. paspaloides*)
Ustilago Panici-proliferi, 11
Ustilago Rickerii, 11
Panicum glabrum, see **Syntherisma Ischaemum**
Panicum hirticaule
Sorosporium Syntherismae, 38
Panicum leucophaeum, see **Trichachne insularis**
Panicum miliaceum
Sphacelotheca Panici-miliacei, 997
Panicum obtusum
Tilletia pulcherrima, 52
Panicum paspaloides, see **P. geminatum**
Panicum proliferum, see **P. dichotomiflorum**
Panicum reptans
Sorosporium ovarium, 1005
Panicum rottboellioides
Sphacelotheca diplospora var. glabra, 27
Panicum saccharatum, see **Trichachne saccharata**
Panicum sanguinale, see **Syntherisma sanguinale**
Panicum stramineum; P. Vaseyanum
Sorosporium Syntherismae, 1006
Panicum virgatum
Tilletia Maclagani, 50
Tilletia pulcherrima, 52, 1013
Ustilago hypodytes, 978
Ustilago togata, 14 (as U. pustulata), 986
Panicum viscidellum
Sphacelotheca veracruziana, 994
Panicum Walteri, see **Echinochloa Walteri**
Panicum sp.
Sphacelotheca diplospora var. verruculosa, 27

Papaver Rhoeas; P. somniferum
Entyloma fuscum, 66, 1025
Pappophorum Wrightii
Ustilago Hieronymi, 13
Paspalum conjugatum
Ustilago Schroeteriana, 988
Paspalum notatum
Sphacelotheca Paspali-notati, 28
Paspalum paniculatum, see **P. repens**
Paspalum plicatulum
Tilletia rugispora, 52
Paspalum repens
Ustilago Schroeteriana, 988
Paspalum Urvillei (*P. velutinum*)
Ustilago Holwayana, 17
Paspalum velutinum, see **P. Urvillei**
Pennisetum alopecuroides
Sphacelotheca Penniseti-japonici, 995
Pennisetum japonicum, see **P. alopecuroides**
Persicaria acris, see **P. punctata**
Persicaria amphibia; P. Careyi
Ustilago utriculosa, 22, 992
Persicaria Hydropiper
Melanopsichium austro-americanum, 30
Sphacelotheca Hydropiperis, 30, 999
Ustilago utriculosa, 22, 992
Persicaria hydropiperoides
Sphacelotheca Hydropiperis, 999
Ustilago utriculosa, 22, 992
Persicaria incarnata; P. lapathifolia
Melanopsichium austro-americanum, 30, 1000
Ustilago utriculosa, 22, 992
Persicaria mitis (*P. Persicaria*)
Sphacelotheca Hydropiperis, 30
Ustilago utriculosa, 992
Persicaria Muhlenbergii
Ustilago utriculosa, 992
Persicaria pennsylvanica
Melanopsichium austro-americanum, 30, 1000
Ustilago utriculosa, 22, 992
Persicaria Persicaria, see **P. mitis**
Persicaria punctata
Entyloma Polygoni-punctati, 1025
Sphacelotheca Hydropiperis, 30, 999
Ustilago utriculosa, 22, 992
Persicaria spectabilis
Entyloma Polygoni-punctati, 1025
Persicaria sp.
Sphacelotheca borealis, 999
Phalaris arundinacea
Ustilago echinata, 20, 990
Ustilago striaeformis, 989
Phleum pratense
Entyloma crastophilum, 60
Ustilago striaeformis, 18, 989
Phragmites communis
Neovossia iowensis, 53
Phragmites Phragmites, see **P. communis**
Phyllostachys bambusoides; P. Henonis; P. Quillioi
Ustilago Shiraiana, 979
Physalis angulata; P. heterophylla; P. lanceolata
Entyloma australe, 64, 1023
Physalis lanceolata var. **laevigata**, see **P. longifolia**
Physalis longifolia; P. neomexicana
Entyloma australe, 64, 1023
Physalis philadelphica, see **P. subglabrata**
Physalis pruinosa; P. pubescens; P. rotundata; P. subglabrata; P. turbinata; P. virginiana; P. viscosa
Entyloma australe, 64, 1023
Poa annua
Ustilago striaeformis, 18
Poa Buckleyana, see **P. scabrella**
Poa compressa
Ustilago striaeformis, 989
Poa debilis, see **P. languida**
Poa languida (*P. debilis*)
Ustilago striaeformis, 18
Poa megastachya, see **Eragrostis cilianensis**
Poa palustris
Ustilago striaeformis, 989
Poa pratensis
Entyloma irregulare, 60, 1019
Urocystis Agropyri, 1017
Ustilago striaeformis, 18, 989
Poa scabrella (*P. Buckleyana*)
Ustilago hypodytes, 5
Poa triflora, see **P. palustris**
Poa trivialis
Ustilago striaeformis, 989
Polygonatum canaliculatum (*Salomonia commutata*)
Urocystis Colchici, 57
Polygonatum giganteum, see **P. canaliculatum**
Polygonum acre, see **Persicaria punctata**
Polygonum alpinum, see **Aconogonum phytolaccaefolium**
Polygonum amphibium, see **Persicaria amphibia**
Polygonum aviculare
Melanopsichium austro-americanum, 30
Ustilago utriculosa, 22
Polygonum bistortoides, see **Bistorta bistortoides**
Polygonum Careyi, see **Persicaria Careyi**
Polygonum cilinode, see **Bilderdykia cilinodis**
Polygonum Convolvulus, see **Bilderdykia Convolvulus**
Polygonum Davisiae
Ustilago Piperi, 23
Polygonum dumetorum, see **Bilderdykia dumetorum**
Polygonum dumetorum var. **scandens**, see **Bilderdykia scandens**
Polygonum emersum, see **Persicaria Muhlenbergii**

Polygonum erectum
Ustilago utriculosa, 22
Polygonum Hydropiper, see **Persicaria Hydropiper**
Polygonum hydropiperoides, see **Persicaria hydropiperoides**
Polygonum incarnatum, see **Persicaria incarnata**
Polygonum lapathifolium, see **Persicaria lapathifolia**
Polygonum lapathifolium var. **incarnatum**, see **Persicaria incarnata**
Polygonum Muhlenbergii, see **Persicaria Muhlenbergii**
Polygonum Newberryi
Ustilago punctata, 23
Polygonum pennsylvanicum, see **Persicaria pennsylvanica**
Polygonum Persicaria, see **Persicaria mitis**
Polygonum phytolaccaefolium, see **Aconogonum phytolaccaefolium**
Polygonum punctatum, see **Persicaria punctata**
Polygonum sagittatum, see **Tracaulon sagittatum**
Polygonum scandens, see **Bilderdykia scandens**
Polygonum spectabile, see **Persicaria spectabilis**
Polygonum virginianum, see **Tovara virginiana**
Polygonum viviparum, see **Bistorta vivipara**
Potamogeton epihydrus
Doassansia Martianoffiana, 1028
Doassansia occulta, 1027
Potamogeton fluitans var. **americana**
Doassansia domingensis, 1028
Potamogeton heterophyllus
Doassansia Martianoffiana, 1028
Potamogeton natans
Doassansia Martianoffiana, 70, 1028
Doassansia occulta var. Farlowii, 70
Potamogeton Nuttallii
Doassansia occulta, 70
Doassansia occulta var. Farlowii, 70
Potamogeton pennsylvanicus, see **P. Nuttallii**
Potamogeton perfoliatus var. **Richardsonii**; **P. pusillus**; **P. Vaseyi**
Doassansia occulta var. Farlowii, 70
Psilocarya nitens; **P. scirpoides**
Cintractia Psilocaryae, 32, 1001
Puccinellia airoides, see **P. Nuttalliana**
Puccinellia Nuttalliana (*P. airoides*)
Ustilago hypodytes, 5
Pulsatilla hirsutissima, see **P. ludoviciana**
Pulsatilla ludoviciana (*P. hirsutissima*)
Urocystis Anemones, 55, 1014
Quincula lobata
Entyloma australe, 1023
Ranunculus Bongardi
Entyloma Ranunculi, 1020
Ranunculus delphinifolius
Doassansia ranunculina, 68, 1027
Entyloma Ranunculi, 1020
Ranunculus digitatus
Urocystis Anemones, 55
Ranunculus eremogenes
Entyloma Ranunculi, 61
Ranunculus Eschscholtzii
Urocystis Anemones, 55
Ranunculus fascicularis
Entyloma microsporum, 66
Urocystis Anemones, 55
Ranunculus Macounii
Entyloma Ranunculi, 1020
Ranunculus multifidus, see **R. delphinifolius**
Ranunculus pennsylvanicus
Entyloma Ranunculi, 61
Ranunculus pygmaeus
Entyloma microsporum var. pygmaeum, 66
Ranunculus septentrionalis
Entyloma microsporum, 66, 1025
Entyloma Ranunculi, 1020
Urocystis Anemones, 1014
Ranunculus stenolobus
Urocystis Anemones, 55
Ratibida pinnata, see **Lepachys pinnata**
Redfieldia flexuosa
Tilletia Redfieldiae, 50
Rhynchospora, see **Rynchospora**
Ricciocarpus natans
Tilletia sp., 53
Rudbeckia hirta
Entyloma polysporum, 1021
Rudbeckia laciniata
Entyloma compositarum, 62, 1020
Rumex Acetosella, see **Acetosella vulgaris**
Rumex altissimus; **Rumex Brittanica**
Ustilago Parlatorei, 23
Rumex hastatulus
Ustilago Rumicis, 23, 992
Rumex mexicanus
Ustilago Parlatorei, 23
Rynchospora alba
Cintractia Montagnei, 31
Cintractia Taubertiana, 32, 1001
Rynchospora aurea, see **R. corymbosa**
Rynchospora axillaris
Cintractia Taubertiana, 32
Rynchospora barbata
Cintractia leucoderma, 1003
Cintractia Montagnei, 1000
Rynchospora capiteliata
Cintractia Montagnei, 1000
Rynchospora cephalantha, see **R. axillaris**
Rynchospora ciliata
Cintractia Montagnei, 31
Rynchospora corniculata
Cintractia pachyderma, 1004
Testicularia Cyperi, 1010
Rynchospora corniculata var. **macrostachya**, see **R. macrostachya**
Rynchospora corymbosa
Cintractia leucoderma, 1003
Cintractia utriculicola, 35, 1003

Rynchospora cymosa
Cintractia Taubertiana, 32
Rynchospora cyperoides
Cintractia leucoderma, 1003
Rynchospora distans; R. eximia
Cintractia Montagnei, 31, 1000
Rynchospora fascicularis; R. fusca
Cintractia Taubertiana, 32, 1001
Rynchospora gigantea
Cintractia leucoderma, 35
Rynchospora glomerata
Cintractia Farlowii, 1000
Cintractia Montagnei, 31, 1000
Rynchospora glomerata var. **leptocarpa**
Cintractia Farlowii, 1000
Rynchospora inexpansa
Cintractia Taubertiana, 32
Rynchospora macrostachya
Cintractia affinis, 1004
Testicularia Cyperi, 45
Rynchospora Marisculus; R. miliacea; R. oligantha; R. podosperma
Cintractia Montagnei, 1000
Rynchospora semiplumosa
Sorosporium Rhynchosporae, 40
Rynchospora stipitata; R. tenuis
Cintractia Montagnei, 31, 1000
Rynchospora Tracyi
Cintractia striata, 1004
Sagittaria arifolia
Doassansia intermedia, 1028
Doassansia Sagittariae, 69, 1027
Sagittaria graminea
Doassansia Sagittariae, 69
Sagittaria heterophylla, see **S. rigida**
Sagittaria latifolia
Burrillia pustulata, 67, 1026
Doassansia deformans, 71, 1028
Doassansia furva, 1027
Doassansia intermedia, 70, 1028
Doassansia obscura, 71
Doassansia opaca, 69, 1027
Doassansia Sagittariae, 69, 1027
Sagittaria rigida
Doassansia furva, 1027
Doassansia Sagittariae, 69, 1027
Sagittaria variabilis, see **S. latifolia**
Salomonia commutata, see **Polygonatum canaliculatum**
Sanicula canadensis; S. gregaria; S. marylandica; S. Menziesii
Entyloma Saniculae, 64, 1024
Schizachyrium scoparium
Sorosporium Ellisii, 39, 1006
Sorosporium Everhartii, 38, 1006
Sphacelotheca Ischaemi, 27, 996
Sphacelotheca occidentalis, 995
Sphacelotheca Seymouriana, 994
Scilla praecox
Ustilago Vaillantii, 20
Scirpus affinis
Thecaphora Cornuana, 1009
Scirpus brizoides
Cintractia axicola, 1003
Scirpus caespitosus
Cintractia Caricis, 33
Scolochloa festucacea, see **Fluminea festucacea**
Secale cereale
Tilletia foetens, 1010
Tilletia Tritici, 1010
Urocystis occulta, 57, 1017
Ustilago Tritici, 981
Senecio aureus; S. Balsamitae; S. Fendleri
Entyloma compositarum, 62, 1020
Senecio pauciflorus
Entyloma bavaricum, 1023
Senecio Robbinsii
Entyloma compositarum, 1020
Setaria geniculata, see **Chaetochloa geniculata**
Setaria glauca, see **Chaetochloa lutescens**
Setaria imberbis, see **Chaetochloa geniculata**
Setaria italica, see **Chaetochloa italica**
Setaria lutescens, see **Chaetochloa lutescens**
Sida rhombifolia
Entyloma Sidae-rhombifoliae, 1025
Sieglingia purpurea, see **Triplasis purpurea**
Sieversia ciliata
Urocystis Waldsteiniae, 55
Silene acaulis; S. caroliniana
Ustilago violacea, 21, 991
Silene Douglasii var. **Macounii**, see **S. Lyallii**
Silene Lyallii
Ustilago violacea, 21, 991
Silene Menziesii
Sorosporium Saponariae, 1007
Silene multicaulis; S. oregana
Ustilago violacea, 21, 991
Silene pennsylvanica, see **S. caroliniana**
Silene tetonensis
Ustilago violacea, 21
Silene Watsoni
Sorosporium Saponariae, 1007
Ustilago Clintoniana, 21 (as U. violacea var. major), 991
Ustilago violacea, 21
Silphium integrifolium
Entyloma compositarum, 62
Sitanion californicum, see **S. Hystrix**
Sitanion Hystrix (*S. longifolium*)
Ustilago hypodytes, 5, 978
Ustilago Lorentziana, 982
Ustilago minima, 978
Ustilago striaeformis, 18
Sitanion longifolium, see **S. Hystrix**
Smilacina amplexicaulis
Urocystis Colchici, 57
Smilacina stellata
Tubercinia Clintoniae, 54
Urocystis Colchici, 57

Solanum nigrum; S. triflorum
Entyloma australe, 64, 1023
Solidago missouriensis
Thecaphora cuneata, 41
Sonchus oleraceus
Entyloma bullulum, 1025
Sorghastrum avenaceum
Tolysporella Chrysopogonis, 43
Sorghastrum nutans
Sphacelotheca Chrysopogonis, 26
Tolysporella Chrysopogonis, 43
Sorghum halepense; S. sudanense
Sphacelotheca Sorghi, 25, 994
Sorghum vulgare
Sorosporium Reilianum, 29 (as Sphacelotheca Reiliana), 1005
Sphacelotheca cruenta, 994
Sphacelotheca occidentalis, 995
Sphacelotheca Sorghi, 25, 994
Sorghum vulgare, vars. **Caffrorum, Durra, Roxburghii, saccharatum**, and **technicum**
Sphacelotheca Sorghi, 994
Spinacia oleracea
Entyloma Ellisii, 65
Spirodela polyrhiza
Tracya Lemnae, 71, 1028
Sporobolus argutus
Entyloma speciosum, 1020
Sporobolus asperifolius, see **Muhlenbergia asperifolia**
Sporobolus auriculatus, see **Muhlenbergia arenacea**
Sporobolus confusus, see **S. microspermus**
Sporobolus cryptandrus
Ustilago hypodytes, 5
Sporobolus ejuncidus, see **S. gracilis**
Sporobolus gracilis (*S. ejuncidus*)
Ustilago Sporoboli, 16
Sporobolus gracillimus, see **Muhlenbergia filiformis**
Sporobolus indicus
Tolysporella Sporoboli, 1009
Sporobolus junceus, see **S. gracilis**
Sporobolus microspermus
Tilletia asperifolia, 1012
Sporobolus neglectus
Ustilago Vilfae, 17, 987
Sporobolus simplex, see **Muhlenbergia filiformis**
Sporobolus vaginiflorus
Ustilago Vilfae, 17, 987
Stellaria borealis, see **Alsine borealis**
Stellaria Curtisii, see **Alsine Curtisii**
Stellaria Jamesiana, see **Alsine Jamesiana**
Stellaria praecox, see **Alsine praecox**
Stenotaphrum americanum, see **S. secundatum**
Stenotaphrum secundatum
Ustilago affinis, 9, 982
Stipa clandestina; S. columbiana
Ustilago hypodytes, 978
Stipa comata
Sorosporium granulosum, 39, 1007
Urocystis Fraseri, 1018
Urocystis granulosa, 58
Ustilago hypodytes, 5, 978
Ustilago minima, 978
Stipa coronata; S. Elmeri; S. eminens
Ustilago hypodytes, 5, 978
Stipa eminens var. **Andersonii**, see **S. lepida**
Stipa Lemmoni
Ustilago hypodytes, 978
Stipa lepida (*S. eminens* var. *Andersonii*)
Tilletia Wilcoxiana, 51
Stipa Lettermani
Ustilago Jacksonii, 982
Stipa leucotricha
Ustilago hypodytes, 978
Stipa neomexicana
Ustilago hypodytes, 978
Ustilago minima, 978
Stipa occidentalis; S. Richardsonii; S. robusta
Ustilago hypodytes, 5, 978
Stipa Scribneri
Ustilago minima, 978
Stipa setigera
Ustilago hypodytes, 5, 978
Stipa spartea
Ustilago hypodytes, 5, 978
Ustilago minima, 5
Stipa speciosa
Ustilago hypodytes, 978
Stipa Vaseyi, see **S. robusta**
Stipa viridula
Sorosporium granulosum, 39
Ustilago hypodytes, 5, 978
Streptopus roseus
Tuburcinia Clintoniae, 54, 1013
Syndesmon thalictroides
Urocystis Anemones, 55, 1014
Syntherisma filiforme; S. fimbriatum
Ustilago Rabenhorstiana, 17, 987
Syntherisma humifusum, see **S. Ischaemum**
Syntherisma Ischaemum (*S. humifusum*)
Ustilago Rabenhorstiana, 17
Syntherisma sanguinale
Sphacelotheca diplospora, 26
Tilletia pulcherrima, 52
Ustilago Rabenhorstiana, 17, 987
Syntherisma sp.
Sphacelotheca Digitariae, 998
Thalictrum alpinum
Urocystis sorosporioides, 56
Thalictrum dasycarpum; T. dioicum
Entyloma Thalictri, 61, 1020
Thalictrum Fendleri
Urocystis sorosporioides, 56
Thalictrum polygamum; T. purpurascens
Entyloma Thalictri, 61, 1020
Thalictrum sparsiflorum
Urocystis sorosporioides, 56

Tidestromia lanuginosa (*Cladothrix lanuginosa*)
Thecaphora Thornberi, 42
Tillandsia Leiboldiana
Ustilago Tillandsiae, 11
Tiniaria cilinodis, see **Bilderdykia cilinodis**
Tiniaria Convolvulus, see **Bilderdykia Convolvulus**
Tiniaria dumetorum, see **Bilderdykia dumetorum**
Tiniaria scandens, see **Bilderdykia scandens**
Tovara virginiana
Melanopsichium austro-americanum, 30
Ustilago anomala, 992
Tracaulon sagittatum
Sphacelotheca Hydropiperis, 30, 999
Ustilago utriculosa, 22, 992
Trautvetteria grandis
Urocystis Anemones, 1014
Triathera aristidoides
Ustilago Hieronymi, 13, 985
Trichachne insularis; T. saccharata
Sphacelotheca cordobensis, 28 (as S. Panicileucophaei), 998
Tricholaena rosea
Entyloma Farisii, 1025
Tricuspis seslerioides, see **Triodia flava**
Tridens flavus, see **Triodia flava**
Tridens seslerioides, see **Triodia flava**
Trientalis arctica; T. latifolia
Tuburcinia Trientalis, 54, 1013
Trifolium tridentatum
Thecaphora deformans, 41
Trillium chloropetalum; T. grandiflorum; T. ovatum
Urocystis Trillii, 1016
Triodia cuprea, see **T. flava**
Triodia flava (*Tridens seslerioides*)
Ustilago Tricuspidis, 13, 984
Triodia pulchella, see **Dasyochloa pulchella**
Triplasis americana
Ustilago Triplasidis, 12
Triplasis purpurea
Ustilago Sieglingiae, 12, 984
Tripsacum dactyloides
Ustilago Dieteliana, 18
Ustilago Petrakii, 982
Triticum aestivum (*T. vulgare*)
Tilletia foetens, 48, 1010
Tilletia Tritici, 48, 1010
Urocystis Tritici, 1017
Ustilago Tritici, 8, 981
Triticum dicoccum
Tilletia foetens, 1010
Tilletia Tritici, 1010
Triticum durum
Tilletia foetens, 1010
Tilletia Tritici, 1010
Ustilago Tritici, 981
Triticum sativum, see **T. aestivum**
Triticum Spelta
Tilletia Tritici, 1010
Ustilago Tritici, 981
Triticum vulgare, see **T. aestivum**
Trollius sp.
Urocystis Anemones, 55
Troximon purpureum, see **Agoseris purpurea**
Uniola gracilis, see **U. laxa**
Uniola laxa
Ustilago Uniolae, 16, 987
Vagnera amplexicaulis, see **Smilacina amplexicaulis**
Vagnera stellata, see **Smilacina stellata**
Veronica americana; V. peregrina
Entyloma Veronicae, 65 (as E. Linariae var. Veronicae), 1024
Vicia americana; V. caroliniana; V. oregona; V. trifida
Thecaphora deformans, 41, 1008
Viguiera silvatica
Entyloma costaricense, 1025
Vilfa vaginiflora, see **Sporobolus vaginiflorus**
Viola glabella; V. longipes; V. Nuttallii; V. odorata
Urocystis Violae, 56, 1014
Viola Rafinesquii
Urocystis Kmetiana, 1014
Vitis acida, see **Cissus acida**
Waldsteinia fragarioides
Urocystis Waldsteiniae, 55, 1013
Zea Mays
Sorosporium Reilianum, 29 (as Sphacelotheca Reiliana), 1005
Ustilago Zeae, 15, 987
Zizania aquatica
Entyloma lineatum, 60, 1019
Zizania latifolia
Ustilago esculenta, 986
Zygadenus elegans, see **Anticlea elegans**